A STUDY OF THE PERCEPTIONS OF CLIMATE CHANGE AMONG HONOURS STUDENTS AT TWO SOUTH AFRICAN UNIVERSITIES

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Declaration

I declare that THE PERCEPTIONS OF CLIMATE CHANGE AMONG HONOURS STUDENTS AT TWO SOUTH AFRICAN UNIVERSITIES is my own unaided work and that all sources that I have used have been indicated and acknowledged by means of complete references.

Acknowledgement

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Abbreviation and Acronyms

AGW	Anthropogenic Global Warming
CC	Climate change
CDM	Clean development mechanism
CFCs	Chlorofluorocarbons
GHG	Greenhouse gases
IPCC	Intergovernmental Panel on Climate change
MDGs	(United Nations) Millennium Development Gaols
ONGO	Non-government Organisation
UJ	University of Johannesburg
UNSCO	United Nations Educational, scientific and cultural organization
UNFCCC	United Nations Framework convention on climate change
UNISA	University of South Africa
WHO	World Health Organisation

List of Key Terms and Concepts

Anthropogenic- Refers chiefly to environmental pollution and pollutants originating in human activity.

Climate change: Refers to a change of climate that is attributed directly or indirectly to human activities and natural variation.

Global warming: Is the increase in the earth's surface temperature due to natural and human activities.

Greenhouse gas emissions: Is any gaseous compound in the atmosphere that is capable of absorbing infrad radiation, thereby trapping and holding heat in the atmosphere.

Ice Age: Is considered a period of several hundred to several thousand years in which there are layers of ice that extend from the polar regions toward lower latitudes of above sea level to several tens and hundreds meters.

Kyoto Protocol: Is an international agreement linked to the United Nations framework convention on climate change.

Natural disaster: Refers to involvement the interaction of natural hazards, but they may have different vulnerabilities to the damages that ensure from hazard.

Sceptics: Persons who doubt the existence of anthropogenic climate change.

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Abstract

Climate change has become part of daily conversations for scholars and activists. Everyone feels entitled to an opinion on either the causes or the prescriptions of mitigation measures. Very few question the ontological existence of climate change or wonder whether their perceptions are pre-empted by over-arching metanarratives or discourses articulated elsewhere. The impact of media and other sources of information on people's perceptions of climate change are often taken for granted. By using discourse theory, this study aims to uncover taken-for-granted metanarratives within environmentally oriented university Honours student's perceptions of climate change. These students are majoring in the key areas of Environmental Management studies. It aims at assessing whether their perceptions are, consciously or inadvertently, mis (aligned) to any climate change discourses. In discourse theory, Laclau and Mouffe (1985) argued that within a particular knowledge domain, there are several meaning-conferring articulations (discourses) in a struggle of fixing meaning for particular social events and activities. As such, each discourse aims at negating alternative meanings from alternative discourses and naturalising its own interpretations. Within a particular discourse, actors (individuals or groups) are interpellated i.e. defined within specific confines of action and articulations. This study uses this discourse theory to test these hypotheses. As such, the study came up with three conclusions. First, there is a metanarrative of climate change realism, in which the ontological reality of climate change is taken as a given, with no attempt at individual reflection on its ontology. Secondly, the respondents held a mediated concept of climate change, in which their views largely mirror the conceptualisations of the media and other information sources. Lastly, there is an overarching climate-change aversion metanarrative, in which climate change is regarded as negative, without any distinction between its causes and effects.

Key words: Perceptions, Climate change, Views, Attitudes

CHAPTER ONE: INTRODUCTION

1.1 Outline

This chapter serves to introduce the research subject of this thesis. It discusses the background to the study by narrating different perceptions on climate change held among scholars and activists, and narrowing them to current perceptions among certain Honours students. The latter are assumed to be the future key players in policy making and implementation. The main aim of the study, problem statement, motivation and significance of the study will also be briefly explored. The research methodology, which offers the rationale for the research methods used in sampling, data collection and analysis, will also be looked at. The organization of this thesis concludes this chapter.

1.2 Background

The below extracts refer to the phenomena of global warming and climate change for purposes on providing a brief background to these concepts:

''Over the last 50 years, human activities – particularly the burning of fossil fuels – have released sufficient quantities of carbon dioxide and other greenhouse gases to affect the global climate. The atmospheric concentration of carbon dioxide has increased by more than 30% since pre-industrial times, trapping more heat in the lower atmosphere. The resulting changes in the global climate bring a range of risks to health, from deaths associated with extreme high temperatures to changing patterns of infectious diseases''.

World Health Organization, 2012. (*10 facts on climate change and health)*

"In searching for a new enemy to unite us, we came up with the idea that pollution, the threat of global warming, water shortages, famine and the like would fit the bill..."

Club of Rome, *1991. (An elite think-tank Working with the UN)*

"...we need to get some broad based support, to capture the public's imagination.... So we have to offer up scary scenarios, make simplified, dramatic statements and make little mention of any doubts.... Each of us has to decide what the right balance is between being effective and being honest."

Professor Steven Schneider, 1991. (*Nobel Prize winner along with Al Gore****,*** *at Stanford University)*

"No matter if the science of global warming is all phony... climate change [provides] the greatest opportunity to bring about justice and equality in the world."

Christine Stewart*, 1998. (Then Canadian Minister of the Environment, speaking before editors and reporters of the Calgary Herald)*

1.2.1 What on Earth is Going on Here: Contrasting Views on Climate Change

As can be seen from the above, climate change is a complex and contentious issue facing the present world, with the result that many people around the world have been experiencing and debating the threat of climate change in different ways.

Depending on where one stands, climate change can be as old as the earth or as new as the inception of humanity. What is uncontroversial, however, is that all, regardless of opinion, feel the effects of climate change. The recent impact of climate change has led to a proliferation of views and perceptions, and has created fierce debates at different levels. Contemporary climate change debates range from discussions of causality and climate-change impact, to some meta-analytical concerns that ask the relevance of climate change debates.

The controversy of climate change causation has pitted scientists against each other. According to Leiserowitz (2007) and Hoffman (2011), there are two basic schools of thought in climate change debate: those who locate the origins of climate change in human activity (anthropogenic), and those who argue that climate change is an inevitable bi-product of geological and climatological cycles (natural). However, of late, these schools have multiplied to include 5 positions. These respectively claim:
That human activity is causing of climate change (the Anthropogenic School).
That human activity is *not* responsible for climate change (the Sceptics School).
That we are entering the next ice age, no matter what (the Ice age School).
That there has been no significant change in the climate in historical times (the Natural School). That the issues of climate change do not matter in any way (the Agnostic School).

The first position, broadly known as the Anthropogenic School, argues that since the inception of human activity, particularly industrial action, the climate has shown negative signs of change. These have included increase in levels of carbon dioxide (CO_2) and other greenhouse gases (CH_4), which have caused an imbalance in the atmosphere. This impact has begun to be felt approximately in the 19th Century (concurrent with the industrial revolution). For example, a French scientist and a Swedish chemist, Fouries (1827) and Arrhenius (1896), noted enhanced greenhouse gas effects and high levels of CO_2 (Leiserowitz 2008:1). With these and much similar detection, some scientists have argued that there seems to be a clear

positive correlation between the rate of industrialization and that of climate change. As such, these scientists have concluded that the cause of climate change must, therefore, lie in human activity.

The main antithetic position, the Natural School, suggests a natural causation to climate change. This position holds that there exist natural variations in ocean currents, which can alter the distribution of heat and precipitation and large eruptions of volcanoes, can sporadically increase the concentration of atmospheric particles by blocking out more sunlight, and inevitably leading to notable changes in weather and climatic patterns. Taylor (2013:25) added that climate change, such as global warming and cooling, has occurred naturally throughout history over timescales that vary from decades to hundreds of thousands of years.

The other three positions seem to hold little sway. The opinion that interprets perceptible changes in the weather and climatic patterns as an indication of the inception of another glacial age is referred to as the ice-age school. On the other hand, some stakeholders have argued that there has either been no significant changes in the climate in historical times (agnostic), or whatever change has been perceived cannot be attributed to human activity (sceptic). These views seem to have been interpreted differently by many young scientists and politicians, who later become opinion leaders in climate change policy. In light of the foregoing, the hypothesis of this study is that the climate change perception one holds determine the policies and mitigation measures one is likely to advocate for or support.

However, except the agnostics, all the opinions seem to converge on the acknowledgement of perceptible change in climatic and weather patterns over the past years. As such, most people have concentrated their efforts in coming up with strategies of combating the effects of these changes. However, as has been seen with the outcomes in policy and implementation dispositions of the Convention of Peoples (COP) which were incepted by the Kyoto Protocol in 1997, most stakeholders did not agree on the mitigation measures of climate change impact. If they do agree in paper, as has always been the case, they hardly channel their resources and efforts to implement the measures.

With all the bickering and spending on climate change, some radical views have developed and joined the agnostics in challenging the authenticity of climatic change. They have either

questioned the ontology of climate change or challenged the attention and effort it receives. For example, The Club of Rome (1991) stated that climate change 'talk' has been invented while 'searching for a new enemy to unite us…'. In addition, Schneider (1991) has augmented this view by noting that regardless of gross uncertainties on the science of climate change, scary scenarios have been conjured up and simplistic and dramatic statements made, to capture and abuse public imagination, for political and religious reasons.

Regardless of this age-old controversy, Lucarine (2002) defines climate change as,
'dramatic changes to the physical state of a climatic system which is constituted by atmosphere, hydrosphere, lithosphere and biosphere, which are intimately interconnected; therefore, the climate is determined by a set of time average of quantities that describe the structured and the behaviour parts of the climate system, as well as by the correlations among them.'

With the Lucarine definition posing interconnectedness in aspects that are relevant to climate change, this study assumes that, notwithstanding differences in opinion on the causation of climate change, perceptions can actually converge to come up with effective and implementable mitigation policies and measures. As such, the assessment of students' perceptions on climate change and the subsequent delineation into different Schools of Thought is a means to come up with a point of convergence, not only in opinion, but also in action. This study is located in South Africa, which has also some strong significance in the climate change debate. South Africa is one of the third world countries who, according to major surveys, are the victims of climate change perpetrated by major Western states. On the other hand, South Africa is one of the developed countries in the developing world, or as some would like to put it, one of the fast- developing countries in Africa. As such, South Africa has contributed a lot to the challenge of climate change, both in act and in potency. That notwithstanding, it has weak policies on climate change mitigation (Kirato 2010:5).

1.3 The Problem Question and Problem Statement

Climate change is quite an important subject in the discourse of development in this modern age. However, in spite of its significance, there is yet no clear evidence on whether this increasingly pressing subject has been clearly or commonly understood: "What exactly is climate change?" remains a question that has not been satisfactorily answered yet, making it

more of an idea, a perception, a theory than an established fact. This is even more problematic when taking into consideration that the effects of climate change are generally perceived as negative (albeit in varying degrees) to humanity as a whole - a situation that seems to demand a concerted action. The question that becomes problematic, therefore, is whether it is possible to mobilize concerted efforts against the perceived scourge of climate change in a situation where there is no common understanding of the problem at hand. This question is even more important to examine when taking into consideration that the world is being told that the effects of climate change can only be mitigated by the very human beings who are seen as its main cause and catalyst. If this is really the case, it should be realized that not all human beings can contribute the same amounts of time, effort and expertise to the mitigation of climate change. This is simply because human beings possess different powers, capabilities and levels of training when it comes to driving the direction of this mitigation and how the development thereof should take.

In general, some human beings are leaders while others are followers. That is why this research has chosen to focus on two particular, relevant, professionalizing groups when assessing people's perceptions on climate change: Geography and Environmental Management Honours students from two large universities in Johannesburg, i.e., future leaders and opinion-makers in the field.

The rationale for the focus of this research is that these postgraduate (Honours) students in the field of Environmental Management are imminent opinion leaders of climate change policy and its implementation. As such, the research argues that the understanding of these two groups around the issues of climate change will be a determining factor in whether future climate change policies will (or will not) be implemented. This research is also based on the assumption that the lack of implementation in most current climate change policies is due to the schism that exists between two groups of opinion leaders who are not known for easily compromising their views: scholars (and specifically those chosen for participation in this research) and politicians.

According to recent research, there are two major and very different positions on climate change causality. Some people view it as an anthropogenic phenomena (caused by human activities) while others attribute climate change to natural, geographical and climatological cycles. This lack of unanimity among the opinion leaders affects the implementation

disposition and programmes of those involved. This, in turn, ultimately slows down the implementation of climate change policies and mitigation measures. This project is, therefore, more about the differences in perception among opinion leaders than it is about their ignorance. As such, locating the policy position and perceptions of the postgraduate students majoring in issues of climate change, gives the researcher (and indeed the recipients of this research) a glimpse into the future direction of climate change policy.

1.4 The Objectives of the Study

The aim of this study is to assess the (mis-)alignment of climate change perceptions among Honours students in two South African universities. The study will attempt to gauge students' perceptions with the hope of extrapolating the policy direction of climate change. The study will assess how the students are, consciously or inadvertently, aligned or affected by the different Schools of Thought on climate change causation, of which there are actually five at present. The deliberately chosen cohort of Honours students, within a political context, is the right option for correctly understanding the present and future of environmental care.

The purpose of this paper will, therefore, be to assess the climate change perceptions of Honours students majoring in Geography and Environmental Management at the University of Johannesburg and the University of South Africa, 2014. As such, the paper can be broken down into the following:

- To assess the climate change perceptions of Honours students at the University of Johannesburg and University of South Africa.

- To differentiate students' opinions into different Schools of Thought currently existing in the climate change debate.
- To extrapolate imminent climate change policies from the views and perception of these students.
- To provide recommendations and theoretical considerations on the impact of climate change delineation in respect of opinion leaders and policy implementers.

1.5 Rationale

The motivation for this study is to investigate and find out the perceptions of climate change among Honours University students who are regarded to be highly knowledgeable in the matter of climatology and environmental affairs. They are future professionals in the field who will be dictating policy. Regarding understanding the current crisis surrounding climate change adaptation, the study will thus focus on the understanding and response towards climate-change adaptation of Honours University students in Geography and Environmental Management from two large Universities in Johannesburg South Africa.

The researcher believes that this study will impact on current and future climate-change adaptation, and policy-making on how to care for the environment in South Africa as well as the whole continent. Even among this select group of students who have committed themselves to studying the issue of environment management, there exist considerable variations in their understanding of the causes of the problems and just as many variations in their suggestions for remedying the situation.

If the upcoming generation, especially the future-productive university students participating in this research, can achieve a good understanding of the crises around climate change and adaptation, it will be a boon for society. It will also contribute to the implementation of policy without political interference.

Having frequently been engaged in discussions about climate change with various students from different disciplines who come to use the venue of the University of South Africa at Gandhi Square learning Centre, it was shocking to find out that they have different views and perceptions of climate change adaptation while some of them did not even have a clue about climate change. Therefore, focus is placed on students who are doing their Honours in Environmental Management Studies and Geography, in particular climate and climatology, in the interests of acquiring more relevant and meaningful data about perceptions of climate change and adaptation. In Africa, the majority of university students come from previously disadvantaged communities and, as such, has the potential to provide an informed perspective on behalf of the poor section of the population.

Hence, there is a ready motivation to conduct this research around students' perspective on climate change and adaptation and how they react to it. Sample students are drawn from two large universities, namely the University of South Africa, in particular Florida Campus, and the University of Johannesburg. In order to study the perceptions among university students, we shall first look at what climate change is, and then what climate change adaptation is, and why climate change adaptation is needed.

In a society that respects academics, it will be important to know the perceptions of young future academics because they will go on to influence the society. Among them there will be politicians and parliamentarians who will formulate the laws of the country. If they are not aware of these issues, they will continue to formulate climate-unfriendly ones. An informed society is necessary in pushing for environmental friendly laws and advocating for the implementation of these.

This study intends to begin a journey of reflection on this very serious but contentious issue by drawing together perceptions of Honours students on climate change with the aim of establishing, and possibly increasing, their knowledge of, interest in and commitment to the topic.

1.6 Significance of the Study

Climate change is a critical issue that has affected all and sundry in contemporary society. As such many debates, studies and projects have been conducted in a bid to make an efficacious impact in places affected by climate change. This study also hopes to positively contribute to the debate (theory), policy and practice (projects) of climate change.

Ekpoh (2011) has argued that "in order to determine the inevitable effects of sustainability issues on a population and people's perceptions about it, it is important to understand their reactions and analyze their attitudes towards sustainable development and environmentalism". In this same vein, this study, in assessing the perceptions of the participants on climate change, aims to instigate a theoretical reflection in the participants in order to refine their ideological and theoretical positions. Should this optimism materialize, the study hopes to channel these participants, and indeed all the recipients of this study results, into refined theoretical positions on climate change.

Since the study holds the assumption that the target populations in this study are likely to be future opinion leaders in climate change policy, it also hopes to inform them, through critical engagement, into becoming sound policy makers. The study hopes to achieve this by asking probing questions during data collection, and critically engaging with extant policy positions of major players in a bid to deconstruct them and expose their absurdities.

With the preliminary aims achieved, the study is likely to proffer sound recommendation and guidance to climate change practitioners, who after being offered sound climate change positions, are likely to change their implementation dispositions. This will, ultimately result in the implementation of many climate change resolutions that have been made in 19 subsequent Conventions of Peoples (COPs).

In general, the study hopes to be significant in both the theoretical and practical aspects of climate change deliberations, by bringing a critical edge to many positions held by various stakeholders. Since, notwithstanding its popularity, facts on climate change are inaccessible to many. This study hopes to also identify the knowledge gap between experts and laymen and attempt to bridge it by bringing climate change deliberations to the domain of the general public through informing the study participants.

1.7 Research Methodology

Research methodology "is the systematic, theoretical analysis of the methods applied to a field of study, or the theoretical analysis of the body of methods and principles associated with a branch of knowledge" (Levin 1988). It, typically, it encompasses concepts such as a research paradigm or philosophy, research design, research methods, data collection methods, data analysis and methods of data presentation and dissemination. The research methodology does not, however, provide one-size-fits-all solutions but theoretically underwrites the method or a set of methods or even so called "best practices" which can be applied to a specific case.

To accurately access, assess and delineate student's perception of climate change, it was necessary that the research use a post-positivistic paradigm, which allows the combination of both a qualitative and quantitative approach. A quantitative approach, allows objective assessment of research data, while the qualitative approach allows for new ways of

understanding the complexities and contexts of social experience (Mason 2006:10). In as much as the research question assumes an appeal to subjectivity of the respondents, the hypothesis of this study assumes an objective impact of the perspectives of the respondents on the policy processes. According to Babbie and Mouton (2001:27), positivism, the basis on which quantitative research rests, stresses '…structured and replicable observation and measurement, quantification, generalization, and objectivity.' This study assumes that the correlation between students' perspective and their impacts on policy outputs is an objectively replicable phenomenon.

Appositely, Babbie and Mouton (2001:49) describe the quantitative research paradigm as that part of social science research which values measuring properties or quantities as the best way of assessing a phenomena. It also has the analysis of different variables as the most important aspect of research analysis. As such, this study will assess the attitudes and perceptions of Honours students on issues of climate change. These will then be reduced into a series of variables which can be analysed statistically to come up with objectively justifiable and generalizable conclusions.

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance with the research purpose. Therefore, the criteria for relevance points as stipulated by Creswell are as follows: problem statement literature related to the problem, questions to gather data and analyse them, write up a report (Creswell 2013:50). All these were taken into consideration in this research project.

The study used a survey research design. According to Babbie and Mouton (2001:232) surveys are malleable tools in analysing just about any social factor. Its versatility is found in the expansive number of studies in which a survey design can be used. They also argue that surveys are 'also excellent vehicles for measuring attitudes and orientations in large populations … too large to be observed directly. As such, this study saw the survey design as an invaluable tool for assessing the perceptions on climate change in a large population of Honours students. The study made usage of structured and semi-structured interviews to collect relevant data for this exploratory question. A self-administered questionnaire was submitted (by hand) to twenty-five (25) respondents from the two institutes: 15 to University of South Africa (UNISA) and 10 to University of Johannesburg (UJ). The interviews were

conducted with three students at a time, in which a semi-structured interview schedule was used.

In order to gain access to the 25 respondents, the researcher used a convenience sampling method, in which the readily accessible students from both universities were selected for the study sample. Even though known demerits of convenience sampling methods are appreciated, the study assumes that the diverse motivation factors of students to study Environmental Management stratify them to have an opinion on climate change issues. For practical purposes, the research assumed that the convenience sample was representative of the student population is so far as they have interests in environmental issues. Also, the fact that Unisa as a distance learning institute makes it challenging to access all the students on the register at any one point in time. This made the sampling method pragmatic to the researcher.

The collected data will be presented in tables. Bivariate and multivariate analysis was used to analyze data from the questionnaire responses, while content analysis was used in the analysis of interview responses. The results of the analysis will be presented in chapter 5. The researcher was able to consult literature review such as newspapers, articles, books, and scholarly journals. It is here that most reports appear and are the most crucial outlet (Neuman 1997:91).

1.8 Organization of the Thesis

In Chapter 1 of this thesis the motivation for the study, as well as introduction of the research objectives, problem statement, research question, significance of the study, and methodology are presented.

Chapter 2 presents the theoretical framework of the study. It argues that Social processes, and indeed every Social phenomenon, can be understood by uncovering the different frames or discourse that underwrites them.

The general perceptions of climate change to date, measuring the various influences on perceptions of climate change was be utilized are in chapter 3. The school of thought in

climate change, dominancy and hegemony in the climate change discursive field are explained in detail in this chapter 3, too.

The research design and methodology used to get information on the perceptions of Honours students on climate change, background of the study area, methods of data collection and how the questionnaire was be utilized are in Chapter 4. The questionnaire format that was explained to the respondents is also presented here. The responses in both questionnaires and interviews in forms of tables are in chapter 4.

Chapter 5 includes a discussion on the findings collected from the respondents and analyses of the interviews and questionnaires. It starts with an introduction, mechanisms of data analysis, qualitative data analysis, elements of discourse analysis. The analysis and evaluation of the data gathered, climate change causation, climate change mitigation and reflections were explained in detail in chapter 5, too.

CHAPTER TWO: THEORETICAL FRAMEWORK

2.1 Introduction

The aim of this study is to assess the (mis-)alignment of climate change perceptions among Honours students in two South African universities with major schools of thought in climate-change discourse. However, in order to understand different climate change articulations and their relation to major climate change discourse, an appropriate theoretical framework is indispensable. A theoretical framework is an interpretive instrument used to investigate any subject of the choice in any field. This chapter unpacks the theoretical framework that will be used to underpin this study. Asher (1984) gives the following insight on the theoretical framework:

Theories are formulated to explain, predict, and understand phenomena and, in many cases, to challenge and extend existing knowledge, within the limits of the critical bounding assumptions. The theoretical framework is the structure that can hold or support a theory of a research study. It introduces and describes the theory which explains why the research problem under study exists. The selection of a theory should depend on its appropriateness, ease of application, and explanatory power. A good theory in the social sciences is of value precisely because it fulfils one primary purpose: to explain the meaning, nature, and challenges of a phenomenon.

A theoretical framework consists of concepts, together with their definitions, and existing theory/theories that are used for a particular study (Asher, 1984). As such a theoretical framework becomes a stencil through which a particular research problem is viewed and evaluated. Huberman and Miles (1994:18) understands the framework as a visual or written product that explains, in narrative form, the main things to be studied - the key factors concepts, or variables and the presumed relationships among them. This study uses Laclau and Mouffe's discourse theory to frame, analyse and interpret the perceptions and insights of Honours students.

2.2 Definitions of Concepts

Understanding key concepts and variables is indispensable to analyzing students' perceptions and for establishing causal links between variables. Pointedly, the Oxford Dictionary defines perception *"as the way in which something is regarded, understood or interpreted".* In this study, Honours students perceptions will be understood as different understandings, and/or utterances with regards to climate change deliberations. As can be imagined, these vary from person to person. The study, therefore, aims at accessing various student perceptions on climate change and evaluate these with regards to the five major Schools of Thought in the climate-change debate. From these perspectives, the study will hope to gain access to the extent to which the issue of climate change is engaged with or understood. The study ultimately hopes to uncover a multiplicity of views, a number of contentious issues, and multiple paradigms that characterize the climate change debate.

Climate change becomes another obvious key concept for this study. However, to unpack this compound concept, two contributing concepts have to be understood: weather and climate. Baede (2007:87) describes "weather", as that perceptible fluctuating state of the atmosphere around us, characterised by the temperature, wind, precipitation, clouds and other elements. As such, weather has only limited predictability. Beyond a week or two individual weather systems are unpredictable. "Climate" refers to the average weather in terms of the mean and its variability over a certain time-span and a certain area (Baede 2007:87). However, any statistically significant variations of the mean state of the climate or of its variability, typically persisting for decades or longer, are referred to as "climate change" (Baede 2007: 87). Unpacking the causes of these significant variations is the major theme in climate-change debate, and to a limited extent, the main subject of this investigation.

However, other conceptualizations of the concept implicitly include the question of causation. For example, the United Nations Framework Convention on Climate Change (UNFCCC) understands climate change 'as a change in climate which is attributed directly or indirectly to human activities that alter the composition of the global atmosphere and which are in addition to natural climate variability observed over comparable time periods' (UNFCCC 2013). Lucarine (2002) argues that "climate change is the perceptible variation in the physical state of a climatic system which is marked by changes in atmosphere, hydrosphere, lithosphere and biosphere.' In this sense, Lucarine seems to be understanding

climate change in a more physical and natural manner compared to the UNFCCC. The above scenario posits climate change as a complex issue which is understood and/or interpreted differently by different stakeholders.

However, Sorensen (2005:56) prefers a more inclusive approach in his conceptualisation:
The earth's climate is most affected by latitude, the tilt of the Earth's axis, the movements of the Earth's wind belts, and the difference in temperatures of land and sea, and topography. Human activity, especially relating to actions relating to the depletion of the ozone layer, is also an important factor.

Other relevant concepts in climate change debate are 'greenhouse effect' and 'global warming'. Sorensen (2005:60) defines greenhouse effect 'as the phenomenon whereby the earth's atmosphere traps solar radiation, and is mediated by the presence in the atmosphere of gases such as carbon dioxide, water vapor, and methane that allow incoming sunlight to pass through, but absorb the heat radiated back from the earth's surface.' These 'greenhouse gases' (GHGs) provide a blanketing effect in the lower strata of the earth's atmosphere, and this blanketing effect is being enhanced because of human activities like burning of fossil fuels, and unsound industrial and agricultural practices (Sorensen 2005). On the other hand, 'global warming' is that 'increase in the average temperature of the earth's atmosphere, especially a sustained increase great enough to cause changes in the global climate' (Gray 2001: 3). The relationship between global warming and greenhouse effect is that an increase in the amount of greenhouse gases in the earth's atmosphere, leads to entrapment of more and more solar radiations, and thus increasing the overall temperature of the earth (Gray 2001).

The above terms and concepts are major variables that will be used in this study; they are by no means the only concepts relevant to climate change debate. As such, many terms will be introduced and defined within their relevant sections of the study.

This study posits the hypothesis that the above connotations of climate change concepts vary depending on different discourses. In essence, the study will demonstrate that it is challenging, if not impossible, to attain a denotation of the terms for elucidating all major climate change concepts. What does exist seems to be different connotations and stipulative definitions according to variegated schools of thought; curiously, it is these that mark climate change discourse.

A total of five schools of thought have been identified in the climate change debate: anthropogenic, skeptics, natural, ice age, and the agnostic school. These different ideological frameworks can be loosely regarded as different discourses of climate change debate. This study focuses on only two of them, which are seen by many as the major and most influential. These are the anthropogenic and sceptic schools. The Anthropogenic school claims that climate change is the result of human activities occurring during the 200 years of industrialization, while the Sceptics school claims that climate change has nothing to do with human activities but is due to natural processes. According to Boykoff (2007:237):

There are, in principle, competing climate change discourses, albeit certainly not competing on par with each other, and that the respective meaning of climate change is constructed and manifest through contingent social and political process involved in interpretations.

From this major postulation, the theoretical framework of this study, which is based on Laclau and Mouffe's discourse theory, will now be unpacked hereunder.

2.3 Discourse Analysis

Discourse analysis has become *de rigueur* especially when issues of language and communication are concerned. Discourse analysis is necessary in a worldview of social constructionism, since it is the only credible methodological approach in accessing and assessing different discourses with a particular knowledge regime. According to social constructionism uncovering a discourse helps make sense of social utterances, social actions, signs and perceptions within a particular discourse (Jorgensen and Phillips 2002:4). For them, the advantage of using discourse analysis in understanding social practice is its holistic approach and *multiperspectivalism.* In fact, they argue that in discourse analysis theory and method are intertwined to form a complete theoretical come methodological package. However, they argue that those intending to use discourse analysis to understand social practices must also understand its philosophical and epistemological assumptions.

2.4 Key Premises of Social Constructionism

There are various discourse analytical approaches in the social sciences. However, according to Jorgensen and Phillips (2002) all subscribe to the basic ontological premises as discussed below:

2.4.1 *A critical approach to taken-for- granted knowledge*

Social constructionism is based on the argument that the social is not a given, and so is any knowledge of it. It argues that our knowledge of the world is not an objective approach to taken-for-granted knowledge. For example, Foucault claims that power and knowledge are not external to each other, but that they operate in a mutually generative fashion, as "nothing can exist as an element of knowledge if [...] it does not possess the effects of coercion" and as "nothing can function as a mechanism of power if it is not deployed according to procedures, instruments, means, and objectives which can be validated in more or less coherent systems of knowledge" (Foucault 1997e: 52). Foucault's notion of power/knowledge has implications for his conception of truth. What draws his attention is the relationship between knowledge and power, and the way it can lead to the generation of particular 'truths' about the human subject (McHoul & Grace 1993).

In essence, he concurs with the adage that 'knowledge is power' (power/knowledge), contending that power is implicated in the manner in which certain knowledge (and thus truth) is applied (Hall 1997). It will be interesting to find out how Honours students in Environmental Management will apply their power of knowledge that they acquired through a particular discourse to implement policy on issues of climate change.

The Schools of Thought that appear to be most open to this form of discourse and interpretation are: Anthropogenic School and Sceptics School, because they rely for their power of persuasion on a Constructive form of discourse. For example, the Anthropogenic School of Thought uses terms and phrases like "must be stopped", "need for more governmental oversight and control", "industry must be held responsible" and "Society needs to be urgently directed in this matter". For Vanderheiden (2004:151) the industrialized

nations have known that greenhouse pollution was likely to be harmful and thus should now bear moral responsibility for that harm.

Thus, such social constructionism can be seem to be aiming at a critical engagement with knowledge and representations of the world in a bid to deconstruct them and present them as they really are: mere constructions of social interactions; products of different ways of categorizing it.

2.4.2 Historical and cultural specificity

Social constructionism, especially its poststructuralist edge, argues that there is no context-free understanding. As historical and cultural beings, our views about the world are products of historically situated interchanges among people. The ways in which various world views and personal identities are understood and represented could have been different and, moreover, they can change overtime. Discourse is a form of social action that "plays a part in producing the social world-including knowledge, identities and social relations-and thereby maintaining specific social patterns" (Jorgensen and Phillips (2002:4).

2.4.3 The link between knowledge and social processes

The theory of meaning is a major part of social constructionism and, discourse analysis. Their argument is that our ways of understanding the world are created and manifested in social processes. Knowledge is created through social interaction in which conventional truth is constructed, and competes in what is true or false. As such, social constructionism presents a methodical doubt against objective truth, and subscribes to a socio-historical truth and effect. Truth and knowledge have to be understood within a particular context and society, and no attempt should be made to over-extend any truth claims across historical and cultural epochs.

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2.4.4 The link between knowledge and social action

Social constructionism argues that social understanding leads to specified social action. As such social constructions have social consequences.

In line with this preceding foundation, discourse analytical approaches take as their starting point the structuralist/poststructuralist claim that: *our access to reality is always through language with which we create representation of reality that are never mere reflections of a pre-existing reality but contribute to constructing reality* (Jorgensen & Phillips 2002: 8-9). This is however, not synonymous with idealism or denial of the existence of external reality. Laclau and Mouffe (1985: 108) argue that:

The fact that every object is constituted as an object of discourse has nothing to do with whether there is a world external to thought, or with the realism/idealism opposition. An earthquake or the falling of a brick is an event that certainly exists, in the sense that it occurs here and now, independently of my will. But whether their specificity as objects is constructed in terms of 'natural phenomena' or 'expressions of the wrath of God' depends upon the structuring of a discursive field. What is denied is not that such objects exist externally to thought, but the rather different assertion that they could constitute themselves as objects outside any discursive conditions of emergence.

Different discourses each point to different courses of action as possible and appropriate and, as such, the ascription of meaning in discourse works to constitute and change the world. Language is not only a channel of communicating mental states but, most importantly, it is a machine that generates. As a result, constitutes the social world. Changes in discourses are a means by which the social world is changed. Discursive struggles therefore take place in changing and reproducing the social reality (Jorgensen and Phillips 2002: 9).

2.5 Foundations of Discourse Analysis

To a large extent, discourse ‘stems from the structuralist linguistics that followed in the wake of Ferdinand de Saussure’s pioneering ideas’ (Jorgensen & Phillips 2002:9). Saussure argued that language is a network of signs whose meaning is contingent on the adjacent signs

(Saussure 1960). Accordingly, the meaning of individual signs is determined by their relation to other signs, where a sign gains its identity from being different from other signs. As such, Saussure argued that the attribution of a particular meaning to a particular sign is an arbitrary social convention. Even though he argued for the malleability of this meaning over time, Saussure saw this language structure as a social institution that is somewhat fixed, and so were the assigned meanings (Jorgensen & Phillips 2002:9).

The poststructuralists were content with Saussure's structuralism to the extent that that 'signs derive their meanings not through their relations to reality but through internal relations within the network of signs' (Jorgensen & Phillips 2002:9-10). However, they rejected structuralism's view that language is a stable, unchangeable and totalizing structure. In poststructuralist theory, language changes as signs acquire new meaning as the structure changes in response to contextual vagaries (Laclau 1993a: 433). *A fortiori*, the poststructuralists' conclusion on language is that structures only exist in a temporary and not necessarily consistent state. Even though these structuralist *cum* poststructuralist foundations are not embraced by all discourse analytical approaches, the majority of them contend that:
Language is not a reflection of a pre-existing reality.
Language is structured in patterns or discourses – there is not just one general system of meaning as in Saussurian structuralism but a series of systems or discourses, whereby meanings change from discourse to discourse.
These discursive patterns are maintained and transformed in discursive practices.
The maintenance and transformation of the patterns should therefore be explored through analysis of the specific contexts in which language is in action
(Jorgensen & Phillips 2002:12).

If there is one scholar who deserves credit with making the transition from poststructuralism to discourse analysis, it is Michel Foucault. Foucault is a daunting figure in the development of discourse analysis through both theoretical work and empirical research. 'In almost all discourse analytical approaches, Foucault has become a figure to quote, relate to, comment on, modify and criticise' (Jorgensen & Phillips 2002:12). Foucault's main thesis is that: 'in every society the production discourse is at once controlled, selected, organized and redistributed by a certain number of procedures whose role is to ward off its powers and dangers, to gain mastery over its chance events, to evade, formidable materiality' (Foucault, 1972: 52). According to Foucault discourse can be understood as a:

'...a group of statements in so far as they belong to the same discursive formation [...Discourse] is made up of a limited number of statements for which a group of conditions of existence can be defined. Discourse in this sense is not an ideal, timeless form [...] it is, from beginning to end, historical – a fragment of history [...] posing its own limits, its divisions, its transformations, the specific modes of its temporality. (Foucault 1972: 117).

In the same vein, Foucault upholds the general social constructionist premise that knowledge is not just a reflection of reality – and that truth is a discursive construction in which different regimes of knowledge determine what is true and false. In discourse analysis, Foucault aims to uncover the structure of different knowledge regimes. Which scheme of rules, in any particular society, which determines what, can and cannot be said and what is considered to be true and false? He argues that:

Although we have, in principle, an infinite number of ways to formulate statements, the statements that are produced within a specific domain are rather similar and repetitive. There are innumerable statements that are never uttered, and would never be accepted as meaningful. The historical rules of the particular discourse delimit what it is possible to say (Foucault 1972).

Foucault argues that, unlike in the Western conception, subjects are not autonomous and independent, and omnipotent masters – they are created in discourses. He argues that 'discourse is not the majestically unfolding manifestation of a thinking, knowing, speaking subject' (Foucault 1972: 55). In this sense, the subject is *decentred.* Discourses are a product primarily, not of individual subjects, but of power. For Foucault, power is responsible both for creating our social world and for the particular ways in which the world is formed and can be talked about, ruling out alternative ways of being and talking. Accordingly, discourses frame reality into a particular orientation by establishing the 'zones of prohibition' and the 'zone of possibility.'

The majority of contemporary discourse analytical approaches follow Foucault's conception of discourse as relatively rule-bound sets of statements which impose limits on what gives meaning (Jorgensen & Phillips 2002:13). However, many find it difficult to accept Foucault's tendency of identifying only one knowledge regime in each historical period. They contend that every knowledge regime is marred with different discourses existing side by side in a continuous discursive struggle for the right to define truth and determine social action.

Having been dissatisfied with the 'monism' of Foucault's discourse, this study will use Laclau and Mouffe's discourse theory in assessing Honours students' perceptions on climate change, and indeed any other climate change deliberations relevant to this study. However, owing to the fact that Laclau and Mouffe's discourse theory has its foundations firmly planted in Foucault's archeology and genealogical theories, reference to Foucault should be expected in some parts of the study, particularly with reference to knowledge and power. Besides, Foucault's conception of power is adhered to by Laclau and Mouffe's discourse theory. They have fully bought into Foucault's claim that universal truth is illusory and hence unattainable. What exists are different 'truth effects' within particular discourses. Notwithstanding the fact that they have totalizing aspirations, these 'truth effects' are created within discourses and to a large extend hold within that discourse. Discourse analysis therefore is the attempt to uncover how effects of truth are created in discourses. This is what is to be analysed in discursive processes.

2.6 Laclau and Mouffe's Discourse Theory

To Laclau and Mouffe, taking the idea from Jorgensen and Phillips (2002), discourse theory aims at understanding the social as a discursive construction whereby, in principle; all social phenomena can be analysed using discourse analytical tools. They have a clear concept for constructing their theory: by combining and modifying two major theoretical traditions of Marxism and structuralism [P 25]. Marxism provides theoretical foundations on social analysis, whereas structuralism provides a theory of meaning.

Discourse theory takes on board the poststructuralist critique of structuralist linguistics, but still maintains structuralism as a methodological tool for analyzing the discursive creation of meaning. The creation of meaning as a social process is about the fixation of meaning, as if a Saussurian structure existed. We constantly strive to fix the meaning of signs by placing them in particular relations to other signs (Jorgensen & Philips 2002: 24). Discourse theory then has its starting point in the idea that discourse constructs the social world in meaning, and that, owing to the fundamental instability of language, meaning can never be permanently fixed.

"Discourse theory argues that no discourse is a closed entity: it is constantly being transformed through contact with other discourses. In a prolonged *discursive struggle* different discourses – each of them representing particular ways of talking about and understanding the social world – are engaged in a constant struggle with one other to achieve hegemony, that is, to fix the meanings of language in their own way. Hegemony, then, can provisionally be understood as the dominance of one particular perspective" (Jorgensen & Philips 2002:7).

Discourse theory contends, as does structuralism, that signs acquire their meanings by being different from each other, but, in ongoing language use, we position the signs in different relations to one another so that they may acquire new meanings. Language use is a social phenomenon: it is through convention, negotiations and conflicts in social contexts that studies of meaning are fixed and challenged *ad infinitum*. It is precisely those constant attempts that never completely succeed which are the entry point for discourse analysis.

Accordingly, the aim of discourse analysis is to map out the process in which people struggle about the way in which the meaning of signs is to be fixed, and the process by which some fixations of meaning become so conventionalized that they think of them as natural (Jorgensen & Philips 2002: 26). As such discourse can be understood as 'a differential ensemble of signifying sequences in which meaning is constantly renegotiated.' Deleuze see them as 'regimes of statements that attempt to signify and give meaning to the world' (Torfing 1999). Laclau and Mouffe's conception of discourse is summarized in the following quotation:

[W]e will call ***articulation*** *any practice establishing a relation among elements such that their identity is modified as a result of the articulatory practice. The structured totality resulting from the articulatory practice, we will call* ***discours****e. The differential positions, insofar as they appear articulated within a discourse, we will call* ***moments****. By contrast, we will call* ***element*** *any difference that is not discursively articulated. (Laclau and Mouffe 1985: 105)*

From this conceptualization, we can understand discourse as that *fixation of meaning within a particular knowledge domain* or discursive field. All signs, of specific concepts, in a discourse are *moments*. A discourse is formed by the partial fixation of meaning around

certain privileged moments around which the other concepts are ordered. These privileged moments or concepts are called *nodal points*, and it is in relation with which that other concepts get their conceptualization of meaning (Laclau and Mouffe 1985: 112). Depending of a particular contingent structuring of this arrangement, the meaning of different concepts are temporarily crystallised. This crystalisation of moments' meaning is, in essence, the establishment of a discourse. This occurs through the exclusion of all other possible meanings that the signs could have had: that is, all other possible ways in which the signs could have been related to one another (Jorgensen & Phillips 2002:26-27).

However, once established a discourse is established as a totality of meaning ascription and social action prescription. As such, a discourse reduces all possible meaning attributions. All the possibilities that the discourse excludes Laclau and Mouffe call the *field of discursivity* (1985: 111). This becomes, is essence, a reservoir for the 'surplus of meaning' produced by the articulatory practice – that is, the meanings that each sign has, or has had, in other discourses, but which are excluded by the specific discourse in order to create a unity of meaning (Jorgensen & Phillips 2002: 27). Unlike the Saussurean structure which is permanent, in discourse theory these systems of meaning are temporary and incomplete structures. As such, 'there is always room for *struggles* over what the structure should look like, what discourses should prevail, and how meaning should be ascribed to the individual signs'(Jorgensen & Phillips 2002: 29).

This does not only apply to language and different concepts; the same logic applies to the whole social field. Even though in practice, 'we act *as if* the 'reality' around us has a stable and unambiguous structure: *as if* society, the groups we belong to, and our identity, are objectively given facts' (Jorgensen & Phillips 2002: 31). But just as the structure of language is never totally fixed, so are society and identity flexible and changeable entities that can never be completely fixed. The aim of analysis is, therefore, not to uncover the objective reality, but to explore how we create this reality so that it appears objective and natural (Jorgensen & Phillips 2002: 33). As such, discourse theory contends that society is impossible, that it does not exist (Laclau & Mouffe 1985: 111). Society cannot and should not be thought of as an externally existing entity: it is a product of discourse.

'The country', and all other terms for society as a totality, are floating signifiers; they are invested with a different content by different articulations. Laclau's term for a floating signifier that refers to a totality is myth:

*By **myth** we mean a space of representation which bears no relation of continuity with the dominant 'structural objectivity'. Myth is thus a principle of reading of a given situation, whose terms are external to what is representable in the objective spatiality constituted by the given structure. (Laclau 1990: 61).*

According to discourse theory, individual actors are *interpellated* or placed in certain positions by particular ways of talking (Jorgensen & Phillips 2002: 40). Discourses always designate positions for people to occupy as subjects as well as prescribe certain expectations about how to act, what to say and what not to say (Jorgensen & Phillips 2002: 41). Therefore, the subject is not autonomous, but is determined by several discourses and put in fragmented positions.

Accordingly, a discourse functions to give meaning to social life and compete with other discourses, in a discursive struggle, to achieve dominance or hegemony in a discursive field. Theoretically a multitude (even infinite) of ways of articulation is available within the *field of discursivity* of a particular discursive field, or what Foucault calls knowledge regime. Discourse analysis, therefore, is that intentional attempt to reveal the dominant discourse in a discursive field (first reading) and identify what is excluded in the articulations of the dominant discourse (second reading): that is unpacking what is contained within the *field of discursivity* (Torfing 1999).

2.7 Using Discourse Theory in Understanding Climate Change Perceptions

According to many contemporary climate change scholars, the meaning in climate change varies according to worldviews. Pettenger (2007b: 2-5) summarises that explicitly:

Climate change has a strong socially constructed dimension. This does not refer, however, to climate change being a fabricated myth, which contrary to surmounting scientific evidence does not happen. Rather, there is an increasing awareness that climate change in its meaning(s) to specific communities and within concrete societies is first and foremost a social phenomenon. In other words, its roots as well as possible strategies to cope with it are subject to various cultures of interpretation.

With this understanding, this study will use the above theoretical framework to uncover this social *constructedness* of climate change discourse. The study will attempt to identify

different *nodal points* within each discourse. In this study, it is assumed that 'climate change', is the *nodal point* in all the discourses, while its relationship with different other concepts (*moments and elements)* differentiates one discourse from another. Through first reading of Honours student perceptions, the study will also attempt to identify dominant discourse of climate change. This will be done, simultaneously, with the determination of suppressed discourses within the *field of discursivity* of each discourse. The reality is that discourses become the *field of discursivity* to each other. For example, during its temporary dominance (hegemony) the anthropogenic discourse has the natural and agnostic discourses as its *field of discursivity,* and vice versa.

2.8 Conclusion

This chapter presented the theoretical framework of this study. It first argued that social processes, and indeed every social phenomenon, can be understood by uncovering the different frames or discourses that undergird them. Accordingly, this study uses Laclau and Mouffe's discourse theory in assessing Honours students' perceptions of climate change, since it will be argued that the meaning behind climate change debate is both socially constructed as well as socio-historically relevant.

CHAPTER THREE: LITERATURE REVIEW ON CLIMATE CHANGE PERCEPTIONS

3.1 Introduction

There is a vast gamut of literature on the issue of perceptions of climate change. However, for it to be deftly reviewed in this chapter, there is a need for an appreciation of extant literature on climate change, the causality and definition of key terms thereof. Since climate change has attained global prominence, it stands to reason that there will be a multiplicity of perceptions surrounding it from various sources and disciplines. Accordingly, the final section of this chapter will organise these perceptions into five schools of thought.

3.2 Overview of Climate Change Perceptions

Perceptions on the causes of climate change and its effects are thought to contribute to ways of finding possible solutions to the problem (Wolf and Moser 2011; Mertz et al 2009). Although most scientists and the general public believe climate change is taking place, the causes and effects are contentious, thus making it difficult to address the problem (Leiserowitz 2007). There have been attempts at a global level to address climate change: first, committing to reducing emissions (Original framework of the Convention on Climate Change) and second, the introduction of legal and economic sanctions to countries which do not meet their initial target (Kyoto Protocol). Despite the foregoing, there has been little compliance (Leiserowitz 2005). This minimal compliance has been attributed to a lack of willingness to enforce emission reductions because governments are afraid of electoral protest and the reaction of industry among other concerns (Lorenzoni et al 2007). Yet if governments exercised their political will and were more committed to enforcing the reductions, there may be a change.

It is reasonable to assume that, through their studies, geography and environmental science students will have a more detailed appreciation of climate change than the average person. They will have been exposed to the scientific and analytical processes that are used to

determine the risk and danger of climate change (Weber 2010). They may have some understanding of how experts would determine thresholds in physical vulnerability, social vulnerability to climate change regarding disease and the efforts to determine the maximum levels at which greenhouse gases in the atmosphere are not dangerous (Weber 2010).

Many studies have been conducted on the perceptions that the public hold on climate change. Yet little work has been done to establish the perceptions of Environmental students and Geography students on climate change. A notably drop in the ocean is Tse Ka Ho's magisterial study of Hong Kong student's perceptions on climate change and engagement in low Carbon behaviours (2013). This review of related literature therefore is derived from other studies on the general public to establish how they perceive climate change and what influences their perceptions.

Climate change has been defined by Weber (2010) as systematic changes in average conditions over time. These changes are difficult to observe and discern without statistical measurement, and this makes it difficult for the sceptics to believe climate change is happening (Weber 2010). Although climate change may occur in different parts of the world, it will result in heterogeneous effects which may result in the destruction of some ecosystems (Brody et al 2008; Leiserowitz 2005). Climate change is not a new phenomenon, as early as 1827 Fouries noted an increase in atmospheric carbon dioxide (CO_2) levels and greenhouse gas effects (Leiserowitz 2007). There have been many workers in this field until, notably, Callendar made a link between climate change and anthropogenic climate change in the 1930s (Hulme 2009). Yet there are different schools of thought on what causes climate change, the most dominant being anthropogenic and natural causes. When the link between climate change and emissions was made, the fossil fuel industry in the United States of America in the late 1980s launched a public campaign to discredit science and the anthropogenic causes of climate change (Lorenzoni et al 2007). This campaign and other causes have made it more difficult to convince some members of the public about the link between climate change and human behaviour.

In addition to the public disagreement between scientists and the fossil fuel industry, most climate change information has been relayed to the public through external and virtual sources (Leiserowitz 2005). This makes it difficult for the members of the public to identify the veritable truth among the slew of different voices which are motivated by various

strategic, political, psychological and cultural values (Leiserowitz 2005). This perception is cemented by the use of images which suggest that the effects of climate change are being experienced in other parts of the world or will only take place beyond in the future (Wolf and Moser 2011). However, those who reside in rural areas and rely on the environment for their livelihoods have more direct evidence of the impact of climate change on harvests and livestock. They may be more willing to believe that it is urgent.

An interesting and somewhat surprising finding has been that literature hints that the more educated a person is, the less they believe that climate change is risky. Climate change is a critical issue, one that needs both public buy-in and knowledgeable government officials who can interpret scientific reports on their own. These differences in opinion and the distant nature of climate change with regard to time and space and the mixed information have resulted in difficulty maintaining commitment to the cause (Weber 2010). It appears that while people may know about climate change, they believe that the computer-generated worst case scenario is unlikely to affect them and will most likely happen in another part of the world (Wolf and Moser 2011). Through qualitative assessment, the public will determine the urgency of risk on the basis of whether the projected danger or risk is involuntary, catastrophic, novel or known particularly when other more urgent issues emerge (Brody et al 2008). However, knowing the potential risks does not guarantee action. The public must know the causes, risks and also remain engaged with the issue. Being engaged with the issue of climate change is what guarantees action (Lorenzoni et al 2007). If the public feels that there is little political action, they feel that then the issue is not a priority and this is a major barrier to engagement (Lorenzoni et al 2007).

3.3 Perceptions and the Causes of Climate Change

Although most people report being aware of climate change and its causes and show some concern, they cannot explain in detail its causes, consequences and solutions. They believe that climate change is caused by anthropogenic and natural causes but frequently do not understand the details (Lorenzoni et al 2007). In some instances, the public still associate climate change with the depletion of the stratospheric ozone layer, greenhouse effects and climate variability (Brody et al 2008). This lack of understanding based on wrong knowledge models affects how people would tackle climate change (Wolf and Moser 2011).This is further demonstrated by how people try to provide solutions to climate change by recycling and other strategies which do not curb climate change (Leiserowitz 2005).

3.4 Understanding Perceptions on Climate Change

Wolf and Moser (2011) and Lorenzoni et al (2007) among others explain the different influences on people's perceptions and list them as: their context, direct and vicarious experiences, and traditional ways of learning, how the problem is framed and religious convictions. Firstly, one's context is important in shaping how climate change is viewed. Most people view climate change as more than just an environmental issue but also consider it as having an effect on livelihoods, health and global inequality among other issues (Wolf and Moser 2011). It has also been shown that where there are other more pressing concerns, the priority of climate change as a threat is reduced (Wolf and Moser 2011). An example is given of bio-reserve managers who felt that poaching and other illegal activities were a larger threat than climate change (Wolf and Moser 2011). Another example is when people have to worry about more pressing economic issues, projected climate change is deemed less important (Lorenzoni et al 2007).

In addition, people process information using their pre-existing frames of reference which are shaped by cultural values, beliefs and other world views (Wolf and Moser 2011). This implies that when they receive information, it is analysed through this lens and other personal considerations and this affects how climate change and other issues are perceived. This accounts for the five groups (solidarist, hierarchist, individualist, egalitarian and fatalist) of perceptions which emerge when climate change issues are discussed (Wolf and Moser 2011; Weber 2010). These different groups show different levels of concern and this, in turn, affects how they view possible solutions to the problem. Hierarchical communities perceive industrial and technological risks as opportunities and not threats, thus they see them as less risky (Weber 2010). Egalitarian communities, however, perceived them as threats to their social structure and thus perceive them as risky (Weber 2010). Lorenzoni et al (2007) note that being a fatalist gives rise to scepticism about the reality of climate change, human influence on it and the necessity to engage in mitigation efforts. Belonging to these different cultures therefore would affect how future information on climate change is perceived (Weber 2010; Lorenzoni et al 2007).

Secondly, direct or vicarious experiences of climate change influence how people perceive climate change. In their study, Brody et al (2008) found that respondents who resided closer to the sea perceived they were more at risk of flooding than those who resided much further away. Imagery used in documentary and other films if accompanied with relevant information which does not induce fear or guilt can influence how climate change is viewed by the public (Wolf and Moser 2011). This is very important because most people's encounter of climate change issues may be through different types of media (UNESCO 2014) and it may colour how they perceive additional climate change information. Information which builds fear and guilt is largely seen as manipulative, whereas non-threatening factual images which can be linked to daily events are seen as more effective (Lorenzoni et al 2007).

However, images and experience do not always result in convincing the public about climate change. For instance those who experienced flooding in the United Kingdom did not always experience an increase in concern (Wolf and Moser 2011). The same was observed of some Pacific island dwellers who were threatened with flooding: they did not move but adopted adaptive strategies (Wolf and Moser 2011). This implies that one must also have pre-existing concerns about the environment and the commitment to address climate change (Wolf and Moser 2011). It is interesting to note that although some respondents in a South Pacific study lived on islands which may be viewed as vulnerable due to rising sea water levels, not all respondents felt vulnerable (UNESCO 2014). Although there was an understanding of what it was and concern about the potential issues, some respondents did not feel they were at risk of a personal threat from it (UNESCO 2014). These perceptions of risk had an impact on their response. Those who felt threatened by climate change were more likely to take some action, while those who did not feel threatened did not do anything (UNESCO 2014).

Thirdly, the public learns about the environment by experiencing it. However, in urban areas where there is little opportunity to spend time outside, the public may not experience first-hand the changes in the environment (Wolf and Moser 2011). This implies relying on the media for information. While this is not bad in itself, it requires that the public trust the source and also pay attention to it (Weber 2010). Most people generally do not trust the media because they feel that they are biased, exaggerate, and are inconsistent (Weber 2010; Lorenzoni et al 2007). This implies that they may also have ulterior motives in their reporting because of their different alliances and agendas.

People also need to pay attention to the media to learn about climate change; yet this topic lacks appeal to the general public (UNESCO 2014; Weber 2010). More so, when the issue is presented in the media or by other stakeholders, it is through stories which are full of technical acronyms and aims to meet international agendas (UNESCO 2014). If the information can be made easier to understand by translating it into local languages, this would benefit communities and English second language speaking tertiary students studying these subjects (UNESCO 2014). To make the issue more interesting, the stories could be related to local events so that they could engage the attention of the public, especially when published in different media (UNESCO 2014).

In developing countries, however, people's lives are immersed in the environment and they derive a livelihood from it (Wolf and Moser 2011). Local traditions and customs, which are mostly handed down orally mostly show the link between the environment and living things (Wolf and Moser 2011). This locally interpreted knowledge is still being passed down in rural communities (Wolf and Moser 2011). It forms the basis for one's understanding of environmental issues and how they will assimilate it with scientific knowledge. Some traditional knowledge frameworks allow for space to integrate with scientific knowledge, and this has helped gather data in remote communities (Wolf and Moser 2011). However, this is not always the case and the differences may negatively affect how scientific evidence showing climate change is received (Wolf and Moser 2011). It was also observed by respondents in the South Pacific study that even when their traditional knowledge could augment climate change response, it was often excluded (UNESCO 2014).

Another area of concern is the difference in how the information in these two bodies of knowledge is presented. Traditional knowledge presents the information on climate change as part of one's oral tradition and in keeping with the local cultural grouping's way of life, values, governances and belief system (Wolf and Moser 2011). Scientific knowledge, on the other hand, shows the information and dangers in images which represent trends and phenomena which cannot be translated easily for the local community members (UNESCO 2014; Brody et al 2008). These highly technical presentations may create a seeming incompatibility in the eyes of the community between these two issues and in turn affect how one perceives climate change.

How people perceive climate change causes and solutions is also influenced by who they interacted with. Some communities in the Pacific islands of Samoa, Fiji and Vanuatu were agreed that climate change was caused by human activity but their different approaches to solving it were defined by the organisations they had interacted with (UNESCO 2014). The community in Samoa which had previously received funding from NGOs felt that education, community information and social ties were important and these were to be augmented with project assistance and external finance (UNESCO 2014). The respondents from Fiji on the other hand planted mangroves to protect their land from storm surges, and this shows that this could have been a project intervention (UNESCO 2014). Finally the respondents from Vanuatu who had been working with conservation NGO felt that conservation was important to combat climate change and to protect food security and livelihoods (UNESCO 2014).

Views on personal and collective responsibility also affect how one views climate change and those who are responsible for solving the problem (Wolf and Moser 2011). Views on who is responsible for causing and addressing climate change are influenced by their moral, cultural and ethical convictions (Wolf and Moser 2011). Because industry and business are responsible for most of the greenhouse gas emissions, most people believe that they are responsible for increasing levels of greenhouse gases in the atmosphere. Interestingly, Wolf and Moser (2011) show that despite having similar knowledge on the causes of climate changes, British and Swedish students assigned responsibility for causing climate change to different entities ranging from individuals to government and largely felt that the government should solve the problem.

Although most people felt that they took part in many activities which contributed to climate change, they were only willing to accept responsibility to address some activities (Wolf and Moser 2011). The activities they felt they could control centered on their daily lives and not activities which occurred during their holidays (Wolf and Moser 2011). In addition, it emerged that while acknowledging that some activities are bad for the environment, the public was not willing to forego these as it was seen as affecting their quality of life. An example was that many respondents needed a car to take children to school, do grocery shopping and other responsibilities, and did not consider other alternatives (Wolf and Moser 2011).

An additional factor in how climate change is perceived was the language that was used to frame it and how the public assigned responsibility based on that (Wolf and Moser 2011). If climate change was framed as scientific or a technological innovation, then the general public would feel that it was directed to scientists, researchers and engineers as primary actors and not them (Wolf and Moser 2011). It was only when it was addressed as an issue of environmental stewardship that the general public became involved (Wolf and Moser 2011). The imagery, language, messengers and stories involved were also important as they also contributed to how the public felt (Wolf and Moser 2011).

Finally, beliefs and personal convictions have a great impact on how one perceived climate change. Those who believed in a higher God who also controls the weather were more likely to believe that they as people (government and individuals) were powerless to address climate change (Wolf and Moser 2011). This was exacerbated when knowledge was low. In this instance a natural disaster was seen as a punishment from God (Wolf and Moser 2011). This means that while people know that the climate is changing, their belief that God was in control of the weather left them largely powerless (Wolf and Moser 2011).

Weber (2010) and Brody et al (2008) on the other hand wrote that group membership influenced one's perception, citing the differences in opinion between a rancher or an environment specialist and a fossil fuel worker. The former would perceive risk because they would feel that the environment was under threat and a fossil fuel worker could also perceive the loss of a livelihood as a greater threat to them. A similar dichotomy was observed by Wolf and Moser (2011) of people who dwell in the Arctic whose livelihoods are based on the fuel industry and yet the burning of fuels may threaten their habitat. Also people who were attached to social networks which believed the world is 'fragile' were more likely to adopt behaviours and support policies and interventions which would support the environment (Brody et al 2008).

Other factors which could affect how the issue of climate change is perceived are gender, education and income levels. Citing previous studies, Brody et al (2008) wrote that women were more likely to be aware of environmental risks and readily support environmental initiatives, when compared to their male counterparts. They add that people who are more educated and know more about climate change (cause, effect and possible solutions) were

more likely to have lower levels of risk perception (Brody et al 2008). This was mirrored for people who earned a higher income.

3.5 Definition of Concepts

Understanding key concepts and variables is indispensible to analysising students' perceptions and to establish causal links between variables. To start with, the Oxford Dictionary defines perception *'as the way in which something is regarded, understood or interpreted.'* In this study, Honours students perceptions will be understood as different understandings, and/or utterances with regards to climate change deliberations. As can be imagined, these vary from person to person. The study, therefore, aims at accessing various Honours students perceptions on climate change and evaluates these with regards to the five major Schools of Thought in the climate-change debate. From these perspectives, the study will hope to gain access to the extent to which the issue of climate change is engaged with or understood among Honours students. The study, ultimately hopes to uncover a diversity of views, a number of contentious issues, and multiple paradigms that characterize the climate change debate.

Climate change is a key concept for this study. However, to unpack this compound concept, two contributing concepts have to be understood: weather and climate. Baede (2007:87) describes "weather", as that perceptible fluctuating state of the atmosphere around us, characterised by the temperature, wind, precipitation, clouds and other elements. As such weather has only limited predictability. Beyond a week or two, individual weather systems are unpredictable. "Climate" refers to the average weather in terms of the mean and its variability over a certain time-span and a certain area (Baede 2007:87). However, any statistically significant variations of the mean state of the climate or of its variability, typically persisting for decades or longer, are referred to as "climate change" (Baede 2007: 87). Unpacking the causes of these significant variations is the major theme in climate-change debate, and to a limited extent, the main subject of this investigation.

However, other conceptualisations of the concept implicitly include the question of causation. For example, the United Nations Framework Convention on Climate Change (UNFCCC) understands climate change "as a change in climate which is attributed directly or indirectly to human activities that alter the composition of the global atmosphere and which are in

addition to natural climate variability observed over comparable time periods" (UNFCCC 2013). Lucarine (2002) argues that "climate change is the perceptible variation in the physical state of a climatic system which is marked by changes in atmosphere, hydrosphere, lithosphere and biosphere." Lucarine seem to be understanding climate change in a more physical and natural manner, in contrast with the UNFCCC. The above scenario posits climate change as a complex issue which is understood and/or interpreted differently by different stakeholders.

However, Sorensen (2005:56) prefers a more inclusive approach in his conceptualisation:
The earth's climate is most affected by latitude, the tilt of the Earth's axis, the movements of the Earth's wind belts, and the difference in temperatures of land and sea, and topography. Human activity, especially relating to actions relating to the depletion of the ozone layer, is also an important factor.

Other relevant concepts in climate change debate are '*greenhouse effect'* and '*global warming'*. Sorensen (2005:60) defines greenhouse effect "as the phenomenon whereby the earth's atmosphere traps solar radiation, and is mediated by the presence in the atmosphere of gases such as carbon dioxide, water vapor, and methane that allow incoming sunlight to pass through, but absorb the heat radiated back from the earth's surface." As such these 'greenhouse gases' (GHGs) provide a blanketing effect in the lower strata of the earth's atmosphere, and this blanketing effect is being enhanced because of human activities like burning of fossil fuels, and unsound industrial and agricultural practices (Sorensen 2005). On the other hand, 'global warming' is that "increase in the average temperature of the earth's atmosphere, especially a sustained increase great enough to cause changes in the global climate" (Gray 2001: 3). The relationship between global warming and greenhouse effect is that an increase in the amount of greenhouse gases in the earth's atmosphere, leads to entrapment of more and more solar radiations, and thus increasing the overall temperature of the earth (Gray 2001).

In the main, the above terms and concepts a will be used in this study. They are by no means the only concepts relevant to climate change debate. As such, many terms will be introduced and defined within their relevant sections of the study.

This study hypothesises that the above connotations of climate change concepts vary depending on different discourses. In essence, the study posit an argument that for major climate change concepts it is challenging, if not impossible, to attain a denotation of the terms. What does exist seem to be different connotations and stipulative definitions according to variegated schools of thought; and it is they that mark climate change discourse.

A total of five schools of thought have been identified in the climate change debate: anthropogenic, skeptics, natural, ice age, and the agnostic school. These different ideological frameworks can be loosely regarded as different discourses of the climate change debate. This study focuses on only two of them, which are seen by many as the major and most influential. These are the anthropogenic and sceptic schools. The Anthropogenic school claims that climate change is the result of human activities occurring during the last 200 years of industrialization; while the Sceptics school claims that climate change has nothing to do with human activities but is due to natural processes. In the views of Boykoff (2007:237):

There are, in principle, competing climate change discourses, albeit certainly not competing on par with each other, and that the respective meaning of climate change is constructed and manifest through contingent social and political process involved in interpretations.

These competing discourses of climate change, or as popularly known, schools of thought, are discussed below.

3.6 Different Schools of Thought on Climate Change

From the above discussion of perceptions on climate change, at least three major views can be deduced which can then be discussed within four schools of thought. This study argues that these four schools are different discourses within the discursive field of climate change. The different schools of thought are:

i. The Anthropogenic School
ii. The Natural School
iii. The Ice-Age School
iv. The Sceptics' School

According to Laclau and Mouffe (1985:108), every discourse is characterised by *elements, moments* and *nodal points.* These define a particular discourse and help differentiate it from the rest of articulations within a discursive field. However, according to its post-structuralist tradition, discourse theory militates against fixation of meaning: every discourse within climate change has only a temporary monopoly on meaning. This constant flux in meaning makes possible an extensive field of discursivity within every discursive field; hence there are four schools of thought in climate change deliberations. However, each discourse "partially fixes meaning, which is the chief characteristic of an articulatory practice" (Laclau & Mouffe 1985: 108).

The four schools will now be discussed within this framework, of Laclau and Mouffe's discourse theory.

3.6.1 The Anthropogenic School

The belief that human activities are the causes of climate change has become part of the climate change 'panic' in which individuals and groups have been spurred into frenzied moments of ecological modernism and green radicalism (Isaksen 2013:31). This line of reasoning is of the opinion that any successful mitigation measure must include the reduction of our "carbon footprint". The fact that climate change is anthropogenic appears to have been confirmed by many researchers, scientists and international bodies (Oreskes 2004; Leiserowitz 2005, 2006, 2007; IPCC, 2007; Cook 2010; Murray 2011). According to Cook (2010:11), many climate scientists who have actively published climate research reported that 97% of climate experts are convinced that human activities are changing global temperatures. Cook also looked at all peer-reviewed research on the subject of global climate change published between 1993 and 2003 and found out that among the 928 papers, not a single paper rejected the consensus position that human activities are causing global warming. According to Murray (2011:1) the majority of those working on climate science accept the proposition that Anthropogenic Climate Change (ACC) explains most of the recent rise in global temperatures.

Notwithstanding the inflexibility of this position, material evidence from climate science seems to confirm the positive correlation between increase in greenhouse emissions and

rising in temperatures and melting of ice caps. Given this scenario, the materiality of the evidence is not in dispute.

Proponents of this school argue that the beginning of industrialization was the beginning of climate change (Weber et al 2011; Martinez, 2003; Hamilton 2010). These groups of scientists have argued that the energy behind industrialisation (coal, natural gas, oil) and the products of industrialisation (aerosols, fertilisers, pesticides, plastics, and cans) have been the main forces behind erratic climatic conditions. The IPCC (2013:1) has also weighed in by contending that natural and anthropogenic substances and processes that alter the earth's energy budget are drivers of climate change.

As such this school of thought argues that most of the observed increase in global average temperatures since the mid-20th Century is very likely due to the observed increase in anthropogenic greenhouse gas (GHG) concentrations (IPCC 2013:39). According to the IPCC report (2013) greenhouse gas (GHG) emissions due to human activities have grown significantly since pre-industrial times, with an increase of 70% between 1970 and 2004. Even though one is ignorant of the real figures, the glaring amounts of pollution from industries and exhaust fumes are too obnoxious to ignore. Plus the fact that these industries and their processes are human-made is not without controversy. As such, the conclusion that the earth is warming up as a result of human activities, primarily due to rising levels of carbon dioxide and other heat-trapping atmospheric gases created by burning fossil fuels, can seem plausible (Maibach et al 2011:1). That is why this position (Anthropogenic Global Warming) has gathered a lot of support among scientists, with only 0.7% rejecting it between 1991-2011 (Cook et al 2013:1).

In a survey conducted on public perceptions from Europe done by Hamilton, it was found that from more than 3,000 earth scientists, 90% of them agreed that mean global temperatures have generally risen compared with pre-1880s levels (Hamilton 2010:3). The same survey confirmed that 82% of scientists subscribed to the AGW position. In addition, the IPCC (2007) noted that the atmospheric concentrations of CO_2 and methane (CH_4) in 2005 exceed by far the natural range over the last 650,000 years and that there is very high confidence that the global average net effect of human activities since 1750 has been one of causes of the warming, and that the CO_2 increased by 20% from 1995 to 2005, the largest change for any decade in at least the last 200 years (Murray 2011). In addition, a lot of weather changes have

been observed of late, which are naturally linked to the anthropogenic global warming (AGW):

"Changes in many extreme weather and climate events have been observed since about 1950 and it is very likely that the number of cold days and nights has decreased and the number of warm days and nights has increased on a global scale, and it is likely that the frequency of heat waves has increased in large parts of Europe" (IPCC 2013).

As in all discourse, the anthropogenic school prescribes several practical steps that are consistent with their theoretical assumptions of the climate change problem. These include capping greenhouse gas emissions, green technology (or what has grown to become green revolution) as well as preventive practices such as deforestation and reforestation, mainly geared to reduce annual GHG emissions (Lera et al 2008).

With all this scientific presentations of data and hard 'facts' one ought to be pre-empted of all doubt and be spurred into ameliorative action; but is there all there is to climate change? Are these facts and figures an interpretation of reality, or they in some way create what has to be taken as real? Are we, as humans, the cause of climate change? The answer, or answers, to these questions is still sought for in many different forums. As such, this study will not attempt to contribute towards the search for a decisive answer, but will attempt to refine the parameters of the questions.

As contended before, these different schools of thought are discourses within which, the problem climate change is not only clarified and resolutions attempted, but forums which create climate change problems and assign causality and possible mitigation routes. Having said that this anthropogenic school is a discourse in climate change, does not deny the existence of the 'hard facts'. What it simple means is that the meaning and different inferences derived from these 'hard facts' are objects of articulatory practice of a discourse. 'Whether their specificity as objects is constructed in terms of 'natural phenomena' or 'expressions of the wrath of God' depends upon the structuring of a discursive field (Laclau & Mouffe 1985:108).

As such the anthropogenic school revolves around human agency in causing climate change. The actors are viewed as either perpetrators or victims. In some instances, these are set as

watertight categories that attempt to split the global population into competing factions. This conception is further followed by the following prescriptions: the perpetrators have to pay for the mitigation measures through assistance to the victims should they be in need and through several binding commitments to reducing their emissions.

This discourse of the Anthropogenic School assumes that, should humanity follow all the mitigation routes that science prescribes, the effects of climate change can be combated and, with some luck, reversed.

3.6.2 The Natural School

While the anthropogenic discourse seems to be the orthodoxy in the climate change discourse of the 20th and early 21st centuries, there has been mooted counter-narratives. Some of these narratives have re-interpreted the same 'hard facts' and came out with different conclusions, while others have refused to recognise the facts. Most proponents of the natural school have argued that climate change is a natural process with natural causes. Accordingly, climate changes, not due to perverse human activities, but as part of natural geological and environmental cycles. These include variations in ocean currents, which can alter the distribution of heat and precipitation, and large eruptions of volcanoes can sporadically increase the concentration of atmospheric particles by blocking out more sunlight. These cycles (Milankovitch) of global warming and cooling have occurred naturally throughout history over timescales that vary from decades to hundreds of thousands of years (Taylor, 2013:25). According to Akasofu (2009:1) the earth has experienced a period of being 1^0C cooler than the present between 1400 and 1800, strongly suggesting that dramatic changes in climate is a natural change, not man-made.

The proponents of this discourse also adduce 'hard facts' to prop up their arguments. According to Knut et al., (1999:22) the concentration of methane has always been high even in pre-industrial times. These measurements have been caused by carbon dioxide and methane trapped in air bubbles in ice cores in the Antarctic. Furthermore, it has been said that the total emissions are estimated to 1200-2000 Gtc during less than 10,000 years. Probably more than 600 Gtc were emitted during less than 1,000 years. These emissions exceed both the amount and emission rate of the current man-made emissions (Knut et al 1999:22). They

also argue that the 11-year sunspot cycles, sufficiently accounts for the increased temperatures. Knut et al (1999:22) showed that once temperatures had risen to 5^{o}C - 7 ^{o}C.

3.6.3 The Ice-Age School

This school's argument resembles that of the discourse of the Natural School in some respects. The proponents of the Ice-age school believe that the earth is entering the next ice age and, since this is inevitable, there is nothing humanity can do about it. Again, this school emphasizes that current debates about the extent of future climate changes, whether natural or man–made, demands that we understand the extent, rate and frequency of natural climate change of the past (Mix et al 2001:627). It has been argued in the IPCC (2007) that the large temperature changes of the past million years are the glacial cycles, during which the global mean temperature changed by 4^{0}C to 7^{0}C between ice ages and warm interglacial periods.

3.6.4 The Sceptics' School

This school believes that the issue of climate change does not matter in any way. Its proponents borrow from all other schools to argue their case that climate change does not deserve the attention it unduly receives. For instance, they follow the Natural School discourse in contending that before the industrial revolution there was a cyclical climate change over many years and the earth will always change, no matter what humans do (Morris et al 2013:13). In fact, the sceptics contend that there have been environmental catastrophes before that equate, and sometimes supersede what we see today, as signs of the so-called climate change. For example, they point to what happened in 1350 to 1850 AD, where historical records estimated that about 400,000 people perished in European all Saints Day. They also refer to the storms of 1570, when tens of thousands of people drowned in the Netherlands' during the so-called St Elisabeth floods in 1421 (Van der Lingen 2013:7).

Notwithstanding the 'hard facts' of the scientists within the anthropogenic school, the sceptics claim that climate change is nothing but a 'hoax' that has been 'perpetrated out of the scientific community' (Krugman 2009). The Pew Research Center (2009) found that the number of Americans who subscribe to the AGW has been dwindling in recent years (a drop from 71 percent in 2008 to 57 percent in 2009), a phenomenon that is also occurring in

European countries like the UK and Germany, where climate change belief has historically been stronger than in the US (BBC 2010).

Such surveys provide invaluable insights into the public opinion, and cannot be ignored where solutions for the climate change are sought.. However, these surveys also give us the 'hard facts' of public opinion but do not explain why there are such drastic changes. What is confirmed, however, is the reality of the discursive struggle within the climate change discursive field. Even though the majority of scientists, academics and many policy-makers and business leaders reject the skeptic movement's viewpoint, it is impossible to evaluate the most effective way to counter their views without understanding the underlying motivations and cultural foundations of their arguments (Hoffman 2011:3). Another research done by McCright and Dunlop (2011) found that political conservatism was significantly associated with the denial that global climate change (GCC) is real and with the idea that it is caused by humans. It was also noted that more religious individuals were also more likely to deny GCC (Fusco et al 2012:15).

Most sceptics subscribe to free-market economics. Hence, anything that hints at a monopoly of some sort is violently refuted. As such, the current climate science and climate policy, which is underwritten by the anthropogenic discourse, is seen as a covert way for liberal environmentalists and the government to interfere in the market and diminish citizens' personal freedom. In other words 'the issue isn't the issue; the environmental agenda seeks to use the state to create scarcity as a means to exert their will, and the state's authority, over your lives' (Hoffman 2011:3).

From the above argument, it can be concluded that the sceptics believe that the only relevant social action with regards to climate change is doing nothing. They argue that "doing nothing about climate change is doing something [because] it enables people to keep their money and invest it in the future" (Hoffman 2011:3). This school also believes that politicians are putting the world economy back into the red, on the same views McCright and Dunlap 2011, quoted Lahnsen as following: "*climate change became the cause celebre among conservatives even before the 1972 Earth summit, as exemplified by a 1989 column in Forbes magazine arguing that just as Marxism is giving way to markets, the politicians greens seen determined to put the world economic back into the red, using the greenhouse effect to stop unfettered market-based economic expansion"* From this prospective, it can be deduced that

Sceptics school are interested in making profit in any how without considering the environmental damage

3.7 Dominancy and Hegemony in Climate Change Discursive Field

According to Laclau and Mouffe (1985: 8-9) "our access to reality is always through language with which we create representations of reality that are never mere reflections of a pre-existing reality but contribute to constructing reality". The discursive struggle from the previous section serves to typify this and confirm the constructionist axiom that: "our knowledge and representations of the world are not reflections of the world out there but mere constructions of it: products of our ways of categorizing it" (Jørgensen & Phillips 2002:6). As Foucault (1980) contended, truth is a discursive construction. However, for truth to be constructed Foucault like Laclau and Mouffe, says it is necessary to presuppose power relations. They all believe that power is always bound up with knowledge – with the two presupposing one another (Jørgensen & Phillips 2002:13-14). For Foucault *(*1980: 119*)*:

What makes power hold good, what makes it accepted, is simply the fact that it does not only weigh on us as a force that says 'no', but that it traverses and produces things, it induces pleasure, forms knowledge, produces discourse. It needs to be considered as a productive network which runs through the whole social body, much more than as a negative instance whose function is repression.

Accordingly, power is seen as both a productive and a constraining force that throws its weight behind what is declared as true and renders everything else unutterable. As such, Foucault contends that it is not possible to gain access to a universal truth since it is impossible to talk from a position outside discourse. There is no escape from representation. '*Truth effects*' are created within discourses. In Foucault's archaeological phase, 'truth' is understood as a system of procedures for the production, regulation and diffusion of statements. In his genealogical phase, he makes a link between truth and power, arguing that 'truth' is embedded in, and produced by, systems of power (Jørgensen & Phillips 2002:14). This Foucauldian conception is the foundation for hegemony in Laclau and Mouffe (1985). When applied to the issue of climate change, this will be expressed as an issue related to hegemony of climate change. For example, those who belong to the Anthropogenic School will use institutional power and media knowledge to convince and overcome the arguments of those under the Sceptics' School. Besides, the Sceptics will use power and knowledge to prove that climate change is not an unnatural phenomenon, with a lot of proof that it is in fact a natural formation.

Isaksen (2013:28) claims that in Laclau and Mouffe's discourse theory 'discourses are established as totalities when *signs* are established as *moments* through relations to other signs, and hence are excluding other types of meaning that the signs could have had and the other ways they could have been related to each other'. Other possible meanings and interpretations that are excluded form an extensive *field of discursivity*. This readily means the possibilities of articulating a position on climate change are regulated by a discursive field. However, this dominance is temporary since there is never a total fixation of meaning (Laclau & Mouffe 1985:108). The privileged discursive points responsible for partially fixing meaning in a chain of signification are called *nodal points*. Nodal points are capable of concealing ambiguities.

They are not characterised by a supreme density of meaning, but rather by a certain emptying of their contents, which facilitates their structural role of unifying a discursive terrain [...] What happens is this: a variety of signifiers are floating within the field of discursivity; suddenly some master signifier intervenes and retroactively reconstitutes their identity by fixing the floating signifiers within a paradigmatic chain of equivalence (Slembrouck 2003:24).

The constructions of nodal points which partially fix meaning are crystallised in particular discourses, and this makes social hegemony possible. However, a discourse can never succeed in completely imposing social order. It continues to be subvertable by a contingent surplus in meaning outside itself ('a discursive exterior'). This constant discursive struggle 'break' is a chain of signification, leading to the undermining/creation of old/new social antagonisms/hegemony in the disruption/establishment of old/new nodal points (Isaksen 2013:28). This constant discursive struggle does not only attempt to control the climate or environmental policy; it ultimately is geared towards defining the scope of social action and the society. This is, however, contingently done due to the openness of the social arena. The openness/partial closure of the social is expressed in terms of a field of tension between meaning fixations and discourses being constantly overflown by a contingent infinitude of ambivalence (Slembrouck 2003).

Individual subjects relate to each other through discursive windows. This applies with equal force to producers of the discourse of climate change. When situated within a discourse, other individuals lose their subjectivity and become what discourses make them. In other words, they are interpellated by it—unconsciously or insidiously. Having investigated how actors create and use discourses opens for an understanding of power relations among actors and

discourses, Bäckstrand and Lövbrand (2007) argue that political power stems from the ability to articulate and set the terms of a discourse. Those who define discourses (and ensure that others do not deviate from the roles prescribed for them within a discourse) have power. Sometimes "it is a sign of power that actors can get the discourse to which they subscribe accepted by others" (Dryzek 2005:9).

More pointedly, Pettenger (2007a) investigates the dialogue between power and knowledge in how climate is constructed. She emphasizes that knowledge, and the people who produce knowledge, can be understood as a form of power. In the "expert-driven global environmental change research, scientific knowledge, techniques, practices and institutions enables the production and maintenance of discourses" (Bäckstrand and Lövbrand 2007:125). Hajer's (1995) concept of discourse coalitions attempt to explain how individual actors or proponents of particular discourses join forces and make policy networks in support of social actions prescribed by their discursive claims. These coalitions are pertinent in maintaining momentum in the struggle for discursive dominance and in turning the discursive prescriptions into climate policy. It is clear, then, policies are not as neutral and objective as some would want to imagine:

Discourse analysis can be brought to the forefront of the analysis of power and policy. Policies are not neutral tools but rather a product of discursive struggle. Accordingly, policy discourses favour certain descriptions of reality and hereby empower certain actors while marginalizing others (Bäckstrand and Lövbrand 2007:125*).*

These dominant discursive descriptions "can often be felt in the politics of governments or intergovernmental bodies and in institutional structures" (Dryzek 2005:20). When discourses are bought into by structures of political power, they become institutionalised and become "the formal understanding that provides the context for social interaction, on a par with formal institutional rules" (Dryzek 2005:20). The material aspect of discourses, in the form of climate policy, can be studied through the concept of institutionalisation of discourses. When a set of expressions and practices are formalised they then become routinized in policy practices and institutions (Hajer 1995).

Another outcome of discourse is exclusion. Discourses restrict and enable actors: "The historical rules of a particular discourse delimit what is possible and what is not in the articulatory practice" (Jorgensen & Phillips 2002:13). For Hajer (1995:4) 'discourses imply prohibitions since they make it impossible to raise certain questions or argue certain cases

[and] they imply exclusionary systems because they only authorize certain people to participate in a discourse'. In this regard, a dominant discourse serves as a structure in the way certain meanings and relationships are being naturalised as the truth and alternative meanings are seen as illegitimate (Isaksen 2013). Understanding this reality allows one 'to view climate change from a new perspective with the hope of uncovering processes, actors and structures that have been obscured in the current framing of climate change' (Pettenger 2007a:7).

In the same vein, Isaksen (2013:30) argues that when studying how discourses emerge and become dominant one should pay attention to the economic and political context as well. She argues that in climate change deliberations, particularly at the trans-national stage, "climate policy discourses can obtain legitimacy and gain power by suiting with the larger discursive context of the economic and political paradigm" (Isaksen 2013:30). This is credible given several concerns for 'big' countries to ratify climate change treaties and abide by the set targets, only if anything should come out of the mitigation attempts. As such, all mitigation measures end up sliding into the discourses subscribed to by the 'big' countries and hence sacrificing the 'little narratives' in climate change discursive field.

3.8 Conclusion

The size of the problem of climate change is hardly measured through the assessment of hard scientific facts. Rather it is assessed through the conceptual level at which it is communicated. The communication of climate change betrays underlying perceptions and frames. Within these frames climate change is not only communicated, objectively, it is constructed through the interpretation of 'hard facts'. This chapter assessed four different constructions of climate change: the four schools of thought. Because these schools of thought are not only different reflections of an objectively existing climate change problem, this study conceptualizes them as diverse discourses within the climate change debate. As discourses, the different schools present an interpretation of the 'evidence' in a way that foregrounds 'the (non) problem', and prescribes different social actions relevant to addressing the problem.

CHAPTER 4: RESEARCH METHODOLOGY AND DATA PRESENTATION

4.1 Introduction

This chapter will explain the methodology used to select participants and to gather data as well as present the research findings. In order to assess the perceptions of Honours students with regards to climate change, it was necessary that the researcher should design an effective data collection methodology. The research methodology and data collection will be discussed in full. It will be also important to demonstrate the format of questions which were used to collect data on perceptions of climate change from these university students. Survey and structured interviews were tools of gathering information for the research. Tabulation was the main method of data presentation even though a few histograms were also used.

4.2 Research Objectives

The aim of this study was to assess the (mis-)alignment of climate change perceptions among Honours students in two South African universities.

The objectives of the study are:

- To assess the climate change perceptions of Honours students at the University of Johannesburg and University of South Africa;
- To differentiate students' opinions into different Schools of Thought currently existing in the climate change debate;
- To extrapolate imminent climate change policies from the views and perception of these students, and;
- To provide recommendations and theoretical considerations on the impact of climate change delineation on opinion leaders and policy implementers.

4.3 Research Methodology

4.3.1 Research Design

The study used a post-positivistic paradigm. Post-positivism is regarded by Willis (2007) as a milder form of positivism, which combines the strengths of objectivity with the enhanced interaction between researcher and participant. According to Creswell (2008), post-positivism allows triangulation of qualitative and quantitative research methods. For Taylor and Medina (2013:3), it is 'a modified scientific method for social sciences'. Since this is an exploratory study, aiming at gaining access to influences on the perception of students on climate change, post-positivism is an invaluable paradigm, as it allows the research to garner the strengths of surveys and semi-structured interviews. According to Ryan (2006:20), post-positivism supports open-ended or exploratory study by acknowledging that issues should not be taken at face value, rather reality has to be discovered within participant narratives. The strength of this method lies in its ability to produce results that cannot be generated when qualitative or quantitative methods are applied in isolation (Risjord, Moloney & Dunbar 2001:18).

4.3.2 Location of the Research Project

This research project had taken place at Florida Campus of the University of South Africa (Unisa) and University of Johannesburg's Kingsway Campus, both located in the wider Johannesburg metropolitan. Florida Campus is located about 10 miles west of Johannesburg. The area which is referred to as Florida was originally established as the farm Vogelstruintein and the farms Roodepoort and Paardekraaal were established as mining camps after the discovery of Gold in 1881. The Kingsway Campus of UJ is located at the Gallery exhibits. This location was primarily chosen for its accessibility to the researcher.

4.3.3 Study Population and Sampling

In order to gain access to the 25 respondents the researcher used a convenience sampling method, through which the readily accessible students from both universities were selected into the study sample. Even though known demerits of convenience sampling methods are appreciated, the study assumes that the motivation of students to study Environmental Management stratifies them to have an opinion on climate change issues. The, the research proceeded from the assumption that the convenience sample was representative of the student population in so far as they have interests in environmental issues. Also, the fact that Unisa is a distance learning institute makes it challenging to access all the students on the register at one point in time. This made the sampling method pragmatic to the researcher.

The respondents were selected as they entered the classroom, upon which they were given questionnaires to be completed. The researcher collected the questionnaires and mixed the pieces of paper with different colours in basket (red, yellow and green) and invited all the students who completed the questionnaires to pick one colour-coded paper. All those who picked the green coloured paper were thus randomly selected for interviews. The simplicity of the method enabled the researcher to manage a sizeable number of the respondents as well as the process of sampling. Out of 28 Honours students registered with the Department of Environmental management at the University of South Africa, Florida Campus, 15 (53%) were selected for the study. The selected respondents were aged between 25 and 35 years. At the University of Johannesburg, 10 out of 15 (67%) Honours students were selected. The selected UJ participants aged between 22 and 25 years.

4.3.4 Data Collection

When the right sample was selected the researcher triangulated the data collection methods by using standardised self-administered questionnaires with semi-structured interviews. While the questionnaire enabled the researcher to access commonalities in respondents, the semi-structured interviews allowed participants in-depth expression of their experiences, understanding and beliefs. A self-administered questionnaire was submitted (by hand) to twenty-five (25) respondents from the two institutes: 15 to University of South Africa

(UNISA) and 10 to University of Johannesburg (UJ). The interviews were conducted with three students apiece, in which a semi-structured interview schedule was used.

The semi-structured interviews were selected as the means of data collection because of two primary considerations. First, they are well suited for the exploration of the perceptions and opinions of respondents regarding to the issues of climate change (Barriball *et al* 1994:330). Interviews also have the potential to overcome the poor response rate of a questionnaire survey (Barriball *et al* 1994:328). It is also a suitable method to explore the attitudes, values, beliefs. However, in case where the respondents could not put down the answer in writing, interviews and questionnaires complement each other. In terms of collecting data with interviews, it is a meaningful tool to use to understand deeply the emotions and perceptions with regard to climate change. The data collection process commenced on the beginning of March 2014 and lasted for about two months from March to the end of April. This was because of the availability of the students. For example, in one instance at UJ the interview of one of the respondents was postponed two times due to other commitments this respondent had. Each interview took about 10 to 15 minutes, and the researcher interviewed a maximum of 1 participant per week, depending on their availability. The researcher audio-recorded the interviews, which were later transcribed for analysis. At UJ there was one female and two males (age range 22-25), while at Unisa there were two females and one male (age range 25-32). This meant that the gender balance was achieved by comparing two institutions. In terms of ethnicity: at UJ I interviewed one white male while the others were blacks. At Unisa the interviews involved one white female and two blacks (female and male). Coloured and Indians were not represented.

4.3.5 Data Analysis

The collected data will be presented in tables and interviews will be analysis with qualitative. Bivariate and multivariate analysis was used to analyze data from the questionnaire responses while thematic analysis was used in the analysis of interview responses. The results will be presented in tables and discussed accordingly. The researcher was able to consult literature review including articles, books, and scholarly journals, in order to make sense of the findings. Discourse theory was also used to prime the sense of the findings such that they became intelligible.

4.4 Data Presentation

4.4.1 Questionnaire Responses

Table 4.1: Questionnaire response from the University of South Africa (UNISA)

No	*QUESTION*	*RESPONSE*			*REMARKS*
		Answer	No of responses	*%*	
1	How much has climate change affected you?	Strongly	5	3	33% of respondents have strongly indicated that, climate change has affected them, 13% not too much affected, 6% little affected, while 6% have not been affect at all.
		Average	2	13	
		Little	1	6	
		Not at all	1	6	
		No response	0	0	
2	What do you think influences climate change?	Global warming	2	1	13% of the respondents from UNISA merged climate change with global warming. 7% views climate change as $C0_2$ from the trees, 40% as human activities, 7% as natural process. 7% said its black carbon which causes climate change.
		Human activities	1	7	
		Natural processes	6	4	
		C02 from the trees	1	7	
		Black carbon	1	7	
3	Do You think climate change is a problem?	YES	11	7	The majority (73%) of respondents from UNISA affirms the question. 27% Respondent that climate change is not a problem.
		NO	4	2	
4	What do you know about the effects of climate change?	Abnormal weather patterns	6	4	40% of the respondents perceive climate change as weather patterns, 20% sees climate change as increasingly in temperature, and another 20% perceived climate change as negative effects, while 20% did not have
		Temperature increase	3	2	
		Overall negative effects	3	2	
		Nil	3	2	

					any perceptions.
5	Do you think policy-makers understand the issue of climate change?	YES	8	5	53% think that policy makers understand the challenges of climate change. Others 47% believed that policy makers do not understand the issues of climate change.
		NO	7	4	
6	What is your role now and in the future regarding climate change?	Promoting awareness	5	3	33% indicated that, there is a need for increasing awareness now and in future, whilst 20% see the communication as important, with 40 again mentioning that: communication, awareness, planting trees, collecting plastic in the field need to apply now and in the future. 7% are not sure what to do now and in the future.
		Planting trees	0	0	
		Communicate climate change to the society	3	2	
		Collect litter	0	0	
		Note sure	1	7	
		All of the above [except not sure]	6	4	

Table 4.1: Questionnaire response from the University of South Africa, Continued…

No.	***QUESTION***	***RESPONSE***			***REMARKS***
		Answer	**No.**	**%**	
7	What do you think is the cause of climate change?	Human activities	7	47	47% of the respondents say that human activities are the causes of climate change.13% said that both human activities and natural are the causes of climate change. 13%Ozone layer is the causes of climate change, 7% natural system of the Earth causes climate change. 20% said that human activities, ozone layer, natural system all cause climate change.
		Ozone layer damage	2	13	
		Natural system of the Earth	1	7	
		Both Human activities and natural system	0	0	
		Human activities	2	13	
		All of the above	3	20	
8	Does climate change affect you?	Yes	10	67	67% confirm that they are already affected by climate change by
		No	5	33	

					increases in temperature which causes floods and droughts. 33% said that they are not yet affected by climate change.
9	Where do you think the phenomenon of Climate change originates from?	Politics	1	7	60% believe that climate change is natural formation, 7% said that is politics, 40% did not know anything about climate change.
		History	0	0	
		Natural processes	9	60	
		Sensationalism	0	0	
		Not know	4	27	
10	Do you think that South Africa is already feeling the effects of climate change?	Yes	13	86	86% of the Florida students believe that South Africa is already affected by climate change. 13% of them believe that South Africa is not affected by climate change now.
		No	2	13	
11	Do you think that climate change is caused by cutting down trees?	Definitely	4	26	26% believe that definitely cutting trees is the causes of climate change.54% are not sure. 20% said that cutting trees does not cause climate change. Others did not know anything.
		Probably	0	0	
		Probably not	**0**	0	
		Not sure	8	54	
		No	0	0	
		No answer	3	20	
12	What do you think are the roots of climate change in Johannesburg?	Industry	6	60	60% believe that industry is the roots of climate change in Johannesburg.30% said its pollution. 40%believed that industry, burning fossil, pollution, traffic and poverty are the roots of climate change in Johannesburg
		Poverty	0	0	
		Pollution	3	30	
		Power generation	0	0	
		Burning fossil fuel	1	10	
		Traffic emissions	0	0	
		Not sure	0	0	
		All of the above	4	40	

Table 4.2: Responses of Environmental Management Students of University of Johannesburg (UJ) Kingsway Campus

N	***QUESTION***	***RESPONSE***			***REMARKS***
		Answer	***Nº of Re***	***%***	

			spo nse		
1	How much has climate change affected you?	Strongly	5	50	50% have been strongly affected by climate change, 20% were not much affected, 10% were little affected, 20% did not affected by climate change, 0% no response.
		Average	2	20	
		Little	1	10	
		Not at all	2	20	
		No response	0	0	
2	What do you think about the causes of climate change?	Global warming	0	0	40% of respondents think that climate change is the act of human activities. 30% said it is $C0_2$ from trees 30% said it is natural process. 20% said black carbon is the cause of climate change.
		Human activities	1	10	
		Natural process	3	30	
		C02 from the trees	4	40	
		Black carbon	2	20	
3	Do you think climate change is a problem?	Yes	9	9	90% have indicated d that climate change is a problem. 10% said is not a problem.
		No	1	10	
4	What do you know about climate change?	Weather patterns	3	3	30% said that they know climate change as weather patterns. 50% said it increase temperature. 20% sees climate change as negatives effects.
		It increase temperature	5	50	
		Negatives effects	2	20	
		Nil	0	0	
5	Do think the policy makers understand the issues of climate change?	Yes	7	7	70% of respondents from UJ said that the policy makers understand the issues of climate change, 30% think the policy makers don't understand the issues of climate change.
		No	3	3	
6	What is your role now and	Awareness	8	8	80% believed in awareness now and in future, 10% believed
		Planting trees	1	10	

	in the future regarding to climate?	Communicate climate change to society	0	0	in planting trees. Others did not say anything.
		Collect litter in the field	0	0	
		Note sure	1	10	
		All the above except not sure	0	0	

Table 4.2: Questionnaire Responses from University of Johannesburg (UJ) continued…

No.	***QUESTION***	***RESPONSE***			*REMARKS*
		Answer	**No.**	**%**	
7	What do you think is the causes of climate change?	Human activities	10	100	100% of the participants in UJ views climate change as human activities.
		Ozone layer damage	0	0	
		Natural system of the Earth	0	0	
		Both Human activities and natural system	0	0	
		Cans in the field	0	0	
8	Does climate change affect you?	Yes	8	80	80% of the respondents have been affected by climate change by weather changes and drought, 20% have not been affected by climate change.
		No	2	20	
9	Where do you think the phenomenon of climate change originated from?	Politics	1	10	10% of respondents believe that climate change originated from politics. Others 10% said that it's originated from history. 60% believe that climate change is originated from natural formation. 20% have no idea where climate change originated.
		History	1	10	
		Natural formation	6	60	
		Sensationalism		0	
		Not known	2	20	
10	Do think that South Africa have already feeling the effects of climate change?	Yes	9	90	90% of respondents perceived that south Africa is already feeling the effect of climate change now, 10% said that they are not yet feeling the effects of climate change.
		No	1	10	
11	Do you think that climate change is caused by cutting down trees?	Definitely	4	26	26%believe that definitely cutting trees is the causes of climate change. 54% are not sure.
		Probably	0	0	
		Probably not	**0**	0	
		Not sure	8	54	

		No	0	0	20% said that cutting trees does not cause climate change. Others did not know anything.
		No answer	3	20	
12	What are the roots of climate change in Johannesburg?	Industry	6	60	60% believe that industry is the root of climate change in Johannesburg. 30% said its pollution. 40%believed that industry, burning fossil, pollution, traffic and poverty are the roots of climate change in Johannesburg.
		Poverty	0	0	
		Pollution		30	
		Power generation	0	0	
		Burning fossil	1	10	
		Traffic emissions	0	40	
		Not sure	0	*0*	
		All of the above	4	30	

4.4.2 Remarks

The Q1 was asked to respondents from both institutions about how much climate change had affected them. The responses were as follows: 33% from University of South Africa and 50% from University of Johannesburg (83% in total) have been affected strongly by climate change. A small number (17%) in both Universities said that they were not affected**.** The majority of respondents from both institutions were able to identify climate change with related processes like global warming (13%), greenhouse effect (37%), human activity (80%) and about 30% acknowledged the natural processes that cause climate. As such the majority (74% from Unisa and 90% from UJ) of respondents saw climate change as problem against 27% (from Unisa) and 10% (from UJ) who said it was not. The respondents conceptualised climate change differently, with large numbers associating it with erratic weather patterns (40% Unisa, 30% UJ), increasing temperatures (60%) and general negative weather and climate effects (40%).

The researcher also could reasonably assume that the views of Honours students are influenced by how and which School of Thought they have been exposed to. This is the confirmation that climate change is perceived in different ways by different people. The fact that Unisa and UJ Honours students had different views on some of the questions could be ascribed to differences in curriculum or learning achievement by the students.

The researcher is persuaded that that the differences are due to the different perceptions of climate change.

In response to their understanding of climate change, 60% of the respondents indicated that climate change was a natural process, while 7% of Unisa respondents and 10% of UJ respondents argued that climate change was nothing but a political gimmick. This was somehow a surprise response given the overwhelming response on how human activities and processes lead to climate change embedded in the other questions of the questionnaire. For example, in Question 7 which asked about the causes of climate change, the majority of the respondents (47% from Unisa and 100% from UJ) indicated that human activities were the major causes of climate change. This was also seen in the responses of Question 12 which asked the roots of climate change in Johannesburg. In response 67% of respondents from Unisa and 60% from UJ believed that industries were a major cause, while 27% of respondents from Unisa and 10% of respondents from UJ included pollution, traffic, poverty, power generation and others as part of the root causes of climate change in Johannesburg. An overwhelming majority (86% from Unisa and 90% from UJ) perceived that, the whole of South Africa was already experiencing the effects of climate change.

Question 5 assessed respondents on their perceptions on whether they thought he policy makers understand climate change. Again there was a mixed reaction to this question: the majority (53% from Unisa and 70% from UJ) of respondents believed that policy makers were competent in as far as climate change issues were concerned. With this in mind, the respondents believed that their future role in the climate change debate included awareness (33% from Unisa and 80% from UJ), while 30% believed that they had a role of communicating climate change dynamics. Only a few (10%) believed they had a role in the mitigation measures like planting of trees and reclaiming wastelands. This was because a large number of respondents (54% from Unisa and 40% from UJ) saw deforestation as a contributing factor to the challenge of climate change. With only a small proposition of respondents (20% from Unisa and 30% from UJ) thinking that deforestation had nothing to do with climate change.

4.4.3 Interview responses

Three participants from University of South Africa (Unisa) and three participants from university of Johannesburg (UJ) were interviewed following their participation in the structured questionnaire process. However, the interview schedule had to differ substantially from the questionnaire. This was done in order not to duplicate the data. The names of the participants were withheld to protect anonymity and confidentiality, in line with the ethical considerations agreed on with the participants in the informed consent document. As per best practice, the researcher used symbols to represent participants, with Xf1, Xf2, Xf3 representing participants from Unisa, while Xu1, Xu2, Xu3 standing for participants from UJ. The results of these interviews are tabulated in the following pages.

NOTE: Faulty grammar in the responses has not been corrected, in order to give an accurate impression of the interview.

Table 4.3: Interview Responses from Florida Campus (UNISA)

No	Questions	FLORIDA (UNISA) RESPONDENTS		
		Xf1	**Xf2**	**Xf3**
1	Please tell me something about yourself (where you come from, academic level etc)	My name is Xf1. I am a post-graduate student in Geography department and specialises in Environmental management. I was born in Northwest. Currently, I am staying in Protea Glen, Johannesburg.	I am Xf2, my parents originate from Umtata, but I was born at Baragwanath Hospital, Soweto, in Johannesburg. I am doing Honours in Environmental Management.	I am Xf3. I was born in Johannesburg Hospital, but my parents originate from Limpopo. My level of education is Honours by now.
2	Do you believe there is anything called climate change? Explain what you know about it? How	Yes I believe there is something called climate change. Climate change is weather changing, seasons not regular as	Yes, climate change exists. According to literature, climate change is weather changing. I know climate change is	Yes, there is something called climate change. I know climate change is a global problem, because it

	much have you heard about climate change before granting this interview?	before. Now, it is difficult to know winter season or summer season. I know that climate change is the cause of this problem.	affecting people, like sometimes the earth just change and oceans storms and the land covered with water and people die.	changes our way of living especially when it affects our environment. It also causes a lot of problem.
3	Where do you get your information about climate change? Which source of information about climate change do you trust the most? Do you have enough information on climate change to form an opinion?	I get information through books, internet and newspapers and sometimes, it is viewed through scientific report. As a science student, I trust the scientific report most because other reporters just reproduce what scientific report had published.	I get information through listening to news and from my geography subject. I think I trust government information because government news is accurately and true. I do not think that I do have enough information about climate change, since I am still learning about it.	I got information first in 2010, through Kyoto protocol, Durban. I trust more the environmental activist and scientific report that had published.
4	In the past three years what have you experienced personally, which you attribute to climate change? In other words, have you been affected by climate change personally? Do you think South Africa has been affected yet?	Personally, I am not yet affected by climate change. However, many people in South Africa have been affected by climate change like in Mpumalanga and North-West. It shows that South Africa is already affected by climate change and must do something to protect her people, especially, the poor people.	My family and I have been affected by climate change. It rained so much until it swept away our belongings and our house was demolished by flood. It was so difficult. Yes, South Africa is already affected by climate change with Mpumalanga, North-West and Free State being the most affected provinces; maybe because of the mining activities there.	Personally, I am not affected, but South Africa is already being affected by climate change especially people who live in poverty like the Gugulethus in Cape Town.
5	What do you think, if any, are the negative effects of climate change to the society and environment?	There are a lot of negative effects of climate change like flooding, which makes people hungry because it sweeps away their farm crops. Climate	The negative effects of climate change are too many; like drought and flooding. It can also cause ill health and bring malaria.	Climate change is a bad thing, it affects our health, takes away our houses and crops. It needs the government

		change also causes food insecurity. It also affects our environment by sweeping away our fertile soil.		intervention.
6	Who do you think is most affected by these changes?	Poor people who live in low area are the most affected ones; they children and old ages are vulnerable to climate change.	I think the small citizens like under the age of five years are more vulnerable to climate change.	I am afraid my grandpa will die because of climate change, in my views I think old age are affected by climate change, when it is hot they are suffering a lot.

7	What do you think causes climate change?	Human activities such as industries and cutting trees are the causes of climate change, then, I am %that anthropogenic school is the cause of these crises of climate change.	climate change is catastrophic caused by human activities; it will harm a lot of peoples if nothing can be done now	Climate change is caused by people's activities; by that Anthropogenic School are the main causes of climate change.
8	Do you think there is anything, as human beings, we can do about it? What is your country doing about it? What do you think is you role in it?	Yes, human beings need to stop polluting our atmosphere. My country is doing a lot of project relate to climate change like introduce the green energy But it is not enough, it need more to be done. My role will be to communicate climate change among my communities.	climate change is catastrophic caused by human activities; it will harm a lot of peoples if nothing can be done now	Human being need to stop to build nuclear power, because it causes climate change from C02.
9	Are you aware of any organisation, internationally	Yes I know some of the organisations like Kyoto protocol and	I have no ideas of any organisation dealing with climate change in	Yes I know some international organisations

	and locally, that are doing anything with regards to climate change? Which are they and what are they doing?	UNFCCC these organisations are making laws to climate change, but seem not winning.	South Africa.	dealing with climate change like IPCC. This organisation is publishing the state of climate change and it is behind the anthropogenic school.
10	Should no one do anything about 'climate change' or its effects, where do you see the world in 50 years?	It will cause much catastrophic	Maybe it will be end of the environment	People will die in masses more than today.

Table 4.4: Interview Responses from Kingsway Campus (UJ)

No	**Questions**	***KINGSWAY (UJ) RESPONDENTS***		
		Xu1	**Xu2**	**Xu3**
1	May you tell me something about yourself (where you come from, academic level etc)	I was born in Soweto Johannesburg, I am science student doing Honours level in environmental management	My parents originated in Umtata, but I born in Johannesburg Soweto, Baragwanath Hospital, I am doing Honours in environmental management	I was born in Johannesburg Hospital, but my parents originated in Limpopo, my level of education is Honours by now.
2	Do you believe there is anything called climate change? Explain What do you know about it? How much have you heard about climate change before receiving this interview?	Yes I believe that climate change is here, look how the weather has changed, summer is no longer summer, in winter we experience summer and summer, it	Yes believe there is something called climate change. I heard a lot about climate change and Climate change has not affected me personal, but has affected people from	there is something changing the weather and maybe is called climate change .i has heard a lot about climate change as a student in environment management .I think

		looks like winter. Definitely something is wrong and that something is climate change.	improves shed background	climate change still on early phase and it is a problem.
3	Where do you get your information about 'climate change'? Which source of information, about climate change, do you trust the most? Do you have enough information on climate change to form an opinion?	The books and environmental activist are talking a lot about climate change. As a student in environmental management I had read a lot about environmental change and these changes are caused by climate change.	The source of information, government report is fine for me, even tho there is a lot of politics with regard to climate change, when I read in newspapers I feel like dramatization about climate change. Yes I got enough information to make an opinion, because I am studying environmental management.	I get information about climate change in subject of environmental management, this meant books and articles from the scholars.
4	In the past three years what have you experienced, personally, which you attribute to climate change? In other words have you been affected.	In the past three years I have seen a lot of flooding, for example in 2013 threes province have declared disaster area, I saw a person who has swept away by the flooding.	I have seen many people who lost their belonging due to flooding. I want to say that South Africa is already affected by climate change by time to time it must do something about it.	Personally I am not affected, but South Africa is already affected by climate change. Especially people who live in poverty like Gugulethu in Cape Town
5	What do you think, if any, are the negative effects of climate change for society and the environment?	Climate change has a lot of negative effect like ill health, slowdown our economy It makes people to be poor and loss of lives.	I think climate change is enemies of environment, it affecting our land, it brings a lot of suffering, and it affects our financial state.	I think climate change have brought to many miseries to the poor people.

6	Who do you think is most affected by these changes?	poor people are the most affected ones	aged people, especially women's are affected by climate change	Children's less than 5 years old and aged people are the most affected by these changing of climate change.
7	What do you think causes climate change?	Industries?	Natural, humans being	Human activities
8	Do you think there is anything, as human beings, we can do about it? What is your country doing about it? What do you think is you role in it?	Awareness Making green energy Planting trees.	Communication Politics Mitigation.	To adapt to it Mitigation
9	Are you aware of any organisation, internationally and locally, that are doing anything with regards to climate change? Which are they and what are they doing?	Yes ,UNFCCC Politics	Yes IPCC Making laws	Kyoto protocol Note sure
10	Should no one do anything about 'climate change' or its effects, where do you see the world in 50 years?	It is necessaries to do something about climate change like mitigation	People will die	End of our environment

4.4.5 Remarks

Remark on Q1: All respondents from UJ were from urban Johannesburg except their parents who has originated from outside Johannesburg. The urban environment is rich with sources of information.

Remark on Q2: On the second question was about to find out if the participants are knowledgeable to the existence of climate change. The weather and changing of season were the signs of climate change among the participants.

Remark on Q3: On this question two participants replied that they have heard about the issues of climate change before and one participant said that he never heard about climate change before this survey.

Remark on Q4: as to whether the participants have experience climate change effects; all responded that weather events such as floods and drought have been seen in their area in the past three years.

Remark on Q5: This question about the negative effects of climate change for the society now and in the future; the respondents asserted that climate change will cause poverty and health will deteriorate, including the losses of natural resources.

Remark on Q5: As to who is likely to be affected by these negative changes of climate, the UJ respondents thought that everyone will be affected. However poor people and aged ones were seen to be the ones mostly affected.

Remark on Q6: The sixth question asked the respondents to compare the impacts of human activity and natural causes to climate change. All confirmed that human activities can affect climate change in great deal beyond natural variation.

Remark on Q7: The seventh question was about the participant's perceptions on particular causes of climate change, to which they replied that emission from industry, natural variation and burning fossils fuels were the main causes of climate change.

Remark on Q8: In response to this question, two among the three UJ participants said they knew enough about climate change to make an honest opinion.

Remark on Q9: On which sources of information about climate change the respondents trusted; one trusted scientific reports, the other government reports, while the last indicated that environmental organisation is the best source of information on climate change.

Remark on Q10: To this question, the first participant claimed to know all the policy making international organisations on climate change while the second and third only knew about the Kyoto protocol.

4.4.6 Discussion of Interviews from Both Institutions

All respondents from both institutions seemed to appreciate climate change as a global problem. However two thirds (2/3) of the respondents from both institutions seemed to subscribe to the argument that human activity was the major cause of climate change, a belief espoused by the Anthropogenic School. This is in line with other study contacted by Brown et al among the College students in China and United State, where, the students believed that climate change is caused by human activities (Brown et al 2012:5). Only one respondent between the two groups appreciated the contributions of both human activities and natural causes in climate change. All respondents from both institutions agreed that human activities can bring about changes in the climate beyond the natural variation that takes place anyway. This was largely seen as resulting from several activities by human beings: burning of fossil fuels (gas, coal, oil); $C0_2$ emissions, emissions from industry, natural variation on climate change, deforestation, and destruction of the upper ozone layer.

The majority of interviewees from both institutions claimed to have had personal experience of the effects of climate change, even though they only limited climate change effects to drought and occasional flooding. The respondents asserted hearing a lot about climate change even before this survey. The respondents also saw effects of climate change as destruction of human livelihoods and the ultimate loss of natural resources. All these were seen as having huge financial implications on human societies, particularly with the possible increase in poverty levels illnesses. As can be imagine, the children, poor people as well as the aged were seen as the most likely to be the badly affected victims of climate change. Other respondents, however, managed to identify future generations as the ultimate victims of climate change. A few also

noted that climate change affects everyone without prejudice, both present and future generations, begging the question on the necessity and urgency of mitigation measures.

Most respondents also claimed to have enough information on climate change to make an honest opinion. However, the majority (5/6) of the respondents claimed that they got their information on climate change from trusted scientific journals and environmental organisations while the minority trusted what the government institutes. A third (1/3) of the respondents claimed to know all the relevant policy makers and bodies on climate change, while the majority (1/2) knew something about the Kyoto protocol, and the remainder knew about the UNFCCC only.

NOTE: The transcriptions of interviews are often difficult to do accurately as voices and nuances can be lost in recording devices. Therefore the researcher recognises that did not capture 100% of the recorded words of the respondents.

4.5 Conclusion

This chapter explained the research methodology which was used to collect data on the subject matter of this study. The main part of the chapter presented the data that was collected through a self-administered questionnaire and six (6) interviews. Most respondents seemed to have some knowledge on the subject of climate change. Some claimed to have experienced some catastrophic effects of climate change such as drought and occasional flooding. Nevertheless, the majority of the respondents for both the questionnaire and the interviews leaned towards the perception that human activities were the major causes of climate change; a view normally associated with the anthropogenic school of though. The next chapter will present the results of the discourse analysis of the students' views on climate change.

CHAPTER 5: ASSESSING CLIMATE CHANGE PERCEPTIONS OF HONOURS STUDENTS AT UNISA AND UJ

5.1 Introduction

This study undertakes to assess how university students in South Africa are, consciously and/or inadvertently, aligned or affected by the different schools of thought (or discourses) on climate change causation. The past four chapters have been part of an attempt to realise this aim. This chapter will bring all these attempts together in an endeavour to uncover the (mis)alignment of student's perceptions on climate change with major discourses in the climate change discursive domain. This will be done through an interpretive analysis of the students' views gathered during data collection. In short, this chapter presents the results of discourse analysis of the data presented in chapter 4.

5.2 Mechanisms of Data Analysis

The purpose of analysing data is to obtain usable and useful information. The analysis, irrespective of whether the data is qualitative or quantitative, may: describe and summarise the data; identify relationships between variables; compare variables; identify the difference between variables; forecast outcomes. As such, data analysis can be regarded as 'the process of bringing order, structure and meaning to the mass of collected data' (Kawulich 2003:110). LeCompte and Schensul (1999:25) define analysis as 'the process a researcher uses to reduce data to a story and its interpretation.'

Data analysis is the art and science of reducing large amounts of data into sensible trends of conclusions and recommendations. As can be imagined, it is anything but an orderly process; it is a messy, ambiguous, time-consuming, creative, and fascinating process. It does not proceed in a linear fashion; it is not neat. Hitchcock and Hughes (1995:295) argue that data analysis is the major way 'in which the researcher moves from a description of what is the case to an explanation of why what is the case is the case.' According to Patton (1987), three things occur

during data analysis: data is organised; data is reduced through summarisation and categorisation, and; patterns and themes are identified and linked within the data.

In short;

The process typically involves … breaking down the data into various categories and making connections between the categories in terms of relationships among them… (Kawulich 2003:112).

Data analysis is usually in sync with the rest of the study. If the study is quantitative, statistical data analysis will be more appropriate, and if the study is qualitative, other methods of analysis might be useful in analysing qualitative data.

5.2.1 Qualitative Data Analysis

Qualitative data analysis is as much an art as it is a science. However, the process of analysing qualitative data varies from one study to the next, depending on how the researcher is guided by the research questions, the theoretical framework and the appropriateness of the techniques for making sense of the data (Kawulich 2003). This is because, unlike the analysis of numbers, there is no right or wrong way of analysing opinions, choices, perceptions, descriptions and feelings. The researcher's perception, experience and judgement, of what method will invaluably answer the research questions, is of utmost importance in qualitative analysis (Marshall and Rossman, 1990:111). That having been said, qualitative analysis also has to result in rigorously credible data. As such, validity and reliability are of as utmost importance in qualitative data analysis as they are in quantitative analysis.

5.2.2 Elements of Discourse Analysis

This study uses discourse analysis as both a theoretical framework and a method of data analysis. Each approach to discourse analysis …is not just a method for data analysis, but a theoretical and methodological whole – a complete package. In addition to the theoretical model, methodological guidelines for how to approach a research domain, and specific techniques for

analysis complete the package. In discourse analysis, *theory* and *method* are intertwined and researchers must accept both the basic philosophical premises and the methodological techniques (Jorgenson & Philips 2002:4).

As argued in the theoretical framework, discourse theory is more concerned with general, overarching patterns and aim at a more abstract mapping of the discourses that circulate in society at a particular moment in time or within a specific social domain (Jorgenson & Philips 2002:20). As such the role of the discourse analyst is not to get behind any discourse or to unearth hidden meanings or structures behind discourses. In any case, for Laclau and Mouffe (and Foucault) reality behind or outside the discursive practice is inaccessible. Discourse is constitutive of all spheres of our social world. As such, it is the object of analysis. The analyst has to work with 'articulations' - what has actually been said, written or done - and explore regularities in and across the statements, also attempting to identify social consequences of different discursive representations of reality (Jorgensen and Philips 2002:21).

5.3 Analysis and Evaluation of the Data Gathered

Data was gathered through triangulation of questionnaires (to assess the regularity of perception alignment) and interviews (gain access to student's articulations). For interview results given in chapter four, **Xf1, Xf2, Xf3** represent the respondents from Unisa while **Xu1, Xu2, Xu3** represent the respondent from UJ. The majority of the interviewees were from Johannesburg, with only two coming from outside (Northwest and Eastern Cape). The results from the interviews was analysed into three themes: conceptualization of climate change; climate change causation, and; mitigation measures. These themes are in line with Adger *et al*. (2001:684), who contends that discourse analysis consists of three main steps; analysis of regularities in expression to identify discourses; analysis of the actors producing, reproducing and transforming discourses; and social impacts and policy outcomes of discourses.

As such, the study argues that by unpacking how the participants perceive climate change, one is able to gain into the discourses with which they are aligned. Since discourse theory assumes that each discourse is not only constituted through social action but is also constitutive of the social,

by unpacking what the respondents say about what has to be done (mitigation measures) in terms of controlling or checking the effects of climate change, one stands to gain access into the discourse within which such prescribed action is legitimate. Of course, this analysis will also look out for *intertextuality*, in which particular response 'texts' may contain different voices, some of which might even belong to different discourses (Jorgenson & Philips 2002:151). In addition to this *multivocality*, the analysis will also use *exaggerated detail* to look out for signs of production and reproductions of discourses.

5.3.1 Climate Change Conceptualization

In a number of different ways, participants were asked for their understanding of climate change; weather they appreciate it as a reality or as non-existent. All of the respondents seemed to take the ontology of climate change as a given, and all busied themselves with giving different aspects which they thought best conceptualise what climate change is. These point to the existence of a metanarrative of *climate change realism* to which all respondents seem to subscribe without question. Most respondents also seemed to hold perceptions that 'South Africa was *already* feeling the effects of climate change. These were described as 'deadly …catastrophic…and disastrous'. To others climate change brings with it '…lot of negative effects like ill health, slowdown our economy… makes people to be poor and [brings] loss of lives…; it affects [our] land,… it brings a lot of suffering, and it affects [our] financial state; [has] brought miseries to the poor people…' All these sentiments reveal a certain amount of negativity towards climate change; hence a *climate change aversion* metanarrative. This came through vehemently in the diction the respondents used in their descriptions of climate change. In most cases, climate change is seen as either '…a problem or as causing problems…; …as a bad thing…with a lot of negative effects…' to people and the environment.

However, as to what climate change is precisely, there was a lot of *multivocality*, with some respondents understanding climate change as a *'bad thing'* while others understood it as '*causing bad things.* For one respondent; 'definitely something is wrong and that something is climate change.' Others substantiated their concepts of climate change by quoting events and activities they think of as climate change:

'…the weather has changed, ***summer is no longer summer, in winter we experience summer and summer, it looks like winter****;… floods and drought, sometimes* ***too much [cold] in summer and too much hot in winter****; … time has changed,* ***in winter [it] looks like summer;****… in the past three years I have seen a lot of* ***flooding****;… in 2013 threes province[s] [were] declared disaster area[s];… I saw a person who had [been] swept away by the* ***flooding*** *… bridges too were broken in Johannesburg;… [I have] seen many people who lost their belongings due to* ***flooding****;…climate change has affected me and my family … we lost our shack (home) and our belongings;… the weather is changing, the seasons are no more regular, as it was before, now it is* ***difficult to know the winter season [from] summer season****…' (UJ and Unisa Interview Transcripts 2014).*

Most of the respondents seemed to associate climate change with change in seasons, having seasonal overlap (…winter looks likes summer…). The other element which seems to be associated with climate change is flooding. It seems that the respondents are more conscious to the immediate weather disasters locally. Since not many examples were given from the broader international community of heatwaves, tsunamis, tornadoes, hurricanes, one would imagine that the respondents have localised conceptions of what climate change is. It is however puzzling that those local weather patterns of encroaching snow and heat waves, which are a common occurrence in South Africa, were excluded from the articulations. One is likely to understand the respondents as identifying climate change with 'floods' and 'seasonal changes' almost to the exclusion of anything else.

This is further marked by the sources of the respondents' information on climate change. Only a few (2) of the interviewees seemed to had a personal experience of 'climate change' otherwise the rest got it from their studies (environmental management, lecturers, books, scientific journals) and media (internet, TV news, newspapers). As such, one can argue that the conception of the respondents with regards to climate change is a mediated one. This brings us to a third metanarrative of climate change – *mediated concept.* This reality borders on the hypothesis that the respondents do not have original perceptions from individual cognitive engagement with the subject, but largely regurgitate what *they are told.* This explains the multivocality in their utterances of climate change conceptualisations.

5.3.2 Climate Change Causation

The respondents also came up with an array of climate change causes. Their perceptions were resoundingly the same. This is noteworthy as, for students of Environmental Management, one would have expected that they would be aware of other contending discourses in climate change causation. However, this can be understood as either a deliberate exclusion because it forms the *field of discursivity* of their discourse. On the other hand, it can also be seen as nothing but ignorance of the existence of the contending explanations.

In response to what causes climate change, all respondents seemed to accept that climate is either a *caused cause* or a *caused problem.* In either way the reality of climate change causation was not disputed. To most respondents;

'*…Human activities like industries and land use are the cause of climate change; …* as result of *human activities; human activities from the time of industries revolution have seen to be the cause of climate change… Human activities such as industries and cutting trees are the causes of climate change; … people's activities; A lot of companies like Cement producer are sending a lot of* $C0_2$ *in atmosphere…' (UJ and Unisa Interview Transcript 2014).*

In as much as there was no real attempt in detailing the causal links, most respondents had perceptions that climate change has an anthropogenic causation: human industrial activities were singled out as major causes. Some hints were also thrown in a way of agricultural activities (land use, tree-felling) as also contributors. To a large extent this reflected the *meditated reality* climate change metanarrative, in which the responses of the respondents mirrored the media discourse of climate change – the anthropogenic one. One the other hand, another *intertext* was witnessed again;

Xu3: *Human activities from the time of industrial revolution have been seen to be the cause of Climate change...the cars, industries, factories and coal plants to generate electricity…* all these factors are human influences to climate change. At the same time there is a natural side to *climate change …but this also is happening as the result of anthropogenic influences* (UJ Interview Trascript 2014).

This seeming duplicity or diversity might indicate the reproduction of major clinical discourses: the anthropogenic and natural schools of thought. In as much as the two schools of thought seem to draw a clinical line between themselves, emerging articulations seem to find an intersection between the two. In such an intersection natural formation of climate change seems to be

accelerated by anthropogenic factors. These emerging articulations have between noted by other scholars in the field. For example, Clement and Peterson (2008:1) argued that the last glacial period was characterized by abrupt climate changes that recurred on millennial time scales, which might suggest that the industrial revolution has impacted on this. In as much as the two scholars refuse to speculate as to the causes, their timeframes of the observation of the abruptness might as well point to a correlation between the rate of industrialisation and that of the abruptness of naturally instigated climate change. This hypothesis was actually scientifically confirmed Clement (2008) who, after investigating the correlation between the Milankovitch Cycles and climate change, concluded that the industrial revolution had a dramatic impact on the carbon dioxide content in the atmosphere.

Social constructionism (and by extension discourse theory) argues that social understanding leads to specified social action (Jorgensen & Philips 2002:9). This is also supported by our guiding schema for discourse analysis, Adger *et al* (2001:684) who also argue that the third purpose of discourse analysis is to understand the '... social impacts and policy outcomes of discourses.' As such, having different conceptualizations and causal links that our respondents perceive with regards to climate change, it would be necessary to see how these directly (or indirectly) link with their proposed social action.

5.3.3 Climate Change Mitigation

The respondents' perceptions on climate change-mitigation seemed to have three dimensions: what is already happening, internationally and locally; what should (not) be happening, and; individual responsibility.

There was an overwhelming recognition of the role states play, or an expectation of what states ought to do, in alleviating the effects of climate change. As such, most of the responses and observations were made within this broad normative framework of the role of states in social issues like climate change. There was some acknowledgement that the country (South Africa) is doing 'something' with regards to climate change, even though 'a lot more' could still be done:

‘My country is doing a lot of projects relating to climate change … like introduction of green energy …I guess…, but it is not enough, more still need to be done…more can still be done.’

However, others felt that in the light of this supposed role, South Africa is not doing enough to either, prevent climate change or to mitigate the effects. These perceptions suggested that South Africa was; ‘… not doing enough… it is only accepting a lot of people in our country and… *these guys are affecting our environment … [they] come to produce their product in this land and are polluting our beautiful country*. These kinds of sentiments could be understood within the context of *interpellation*. According to Jorgensen & Phillips (2002:41) in discourse theory, social actors are interpellated, or placed in designate positions as subjects and they are expected to fulfil certain roles prescribed for their social positions. In the above observation, there is a creation of the roles of *villains* and *victims*. There is, unfortunately, still a search for the *heroes*. Foreign companies and actors are regarded as villains, to whom the blame of aggravating climate change is apportioned, while the victims (South African populace) await for the heroes (the state) to do something. With such kind of perception, one can imagine that the only ‘legitimate’ social action prescribed is ‘wait’.

To other respondents ,however, the state (South Africa) is the villain, ‘… aggravating climate change, since [they] need to grow the economy… my country is playing politics, there is a lot of talk about climate change, but to [little] is being implemented;…I think my country is making a lot of money out of climate change…’ (UJ and Unisa Transcripts, 2014). This can also be seen as a perceived disappointment in the context of a normative expectation. The state is to protect its citizens from the effects of climate change. As such if the floods are still happening, bridges and houses being swept away – to an observer the state seems not to be doing its ‘job’. On the other hand, the above perceptions border on scientism towards the deliberations of climate change. In *mediated* perceptions, the state, business and civil society are to a large extent making a big deal out of ‘climate change’ because they want to keep the ‘big talk’ for financial benefits. When conferences are organised, projects initiated, laws made, yet there is no tangible deliverables, the state is perceived as ‘failing’.

From the *mediated* metanarrative, the respondents also managed to identify international organisations that are 'doing something on climate change'. These include the United Nation Convention for Climate Change (UNFCCC) and the International Panel for Climate Change (IPCC). Some however mistook the Kyoto protocol for an organisation. This further confirms that to most respondents climate change, contrary to some responses, is largely a *mediated* reality. However, international climate change organisations were perceived as involved in; '…making laws (policies) … [research] and publishing…dealing with mitigation measures…'

In general, the respondents were very prescriptive: '…human beings need to stop to building nuclear power [stations] because it cause climate change from CO_2 … to stop polluting [our] atmosphere;… to reduce carbon emissions, stop cutting trees and … sending too much smoke in atmosphere..' Mitigating climate change was largely perceived, as in many media sources, as a war for reclaiming the natural state of the environment. This actually betrayed the assumption that climate change was not seen as natural or part of the natural order of things. Some respondents, however, seemed overwhelmed by the reality of climate change and its 'complicated issues' in such a way that they did not think 'nothing much can be done except to adapt to it…'. Some thought 'awareness is necessary in order to understand better the issues of climate change.' All in all, the prescriptions were much disembodied, with no respondent making personal commitment to the cause of mitigation, or thinking that there is something an individual can actually do. The only role they perceived for an individual was that of 'awareness' or 'communication'. Otherwise they felt helpless, impotent and in the grip of unasked -for and unwanted 'scientific' information.

5.4 Concluding Remarks

Having the respondents subscribing to the three metanarratives, *climate change realism*, *climate change aversion*, and *mediated concept revealed that somehow* meant that there was lack of personal engagement with the subject. It also explains the incidence of multivocality in some responses. However, the perceptions of the Honours students under study here can generally be understood to fall largely within the anthropogenic climate-change discourse. As described earlier in chapter 3, this discourse argues that human activities are the causes of climate change.

This line of reasoning is of the opinion that any successful mitigation measure must include the reduction of our 'carbon footprint' (Isaksen 2013:31). This explains why the respondents feel less empowered to participate in any meaningful mitigation, since the reduction of this carbon footprint must of necessity, require large-scale activities. However, the fact that ecological modernism and green radicalism are part of the mitigation strategies of this discourse seemed to have eluded the respondents.

This study was primarily aimed at gauging the perceptions of climate change and adaptation to it among two groups of Honours students majoring in Environment Management chosen from two large universities in Johannesburg, South Africa. It was also aimed at finding out how these perceptions influence their intellectual and practical development around the issue. In this regard, it was important to assess the influence various Schools of Thought have on the formulation of their views. This required the researcher to look at their personal views, and how these are constructed within particular discourses. The results of the discourse analysis of their responses and comments reveal that most of the respondents have a *mediated concept* of climate change. What they regard as climate change is what has been fed to through various sources in media, their text books and their lecturers. The study concluded that, all things considered, it seems that the respondents have no personal reflection on the subject, nor do they seem to have been encouraged to think critically for themselves.

The study also concluded that the respondents have a *climate change realism* metanarrative, in which the ontological reality of climate change is taken for granted. The respondents did not see it as a legitimate inquiry to question the reality of such a thing as climate change. Even as this was asked as one of the interview questions, it was regarded as a non-question. For most, the real questions would have been about causality and mitigation: who or what is to blame? Who should do what? The third conclusion was that for most, this taken-for-granted climate change concept acts as a *climate change aversion* metanarrative. To all respondents, climate change is a negative reality: it is horrific, catastrophic, problematic, complicated and, above all, negative. This was captured in all their responses from the conceptualisation of the issue, its causation, and right up to any mitigation measures. All told, climate change mitigation was largely perceived as 'war' against the scourge of climate change.

5.5 Reflections

This chapter has presented the results of performing a discourse analysis on the responses of two groups of Honours students on climate change. The chapter and the study came up with three major conclusions. First, the all respondents subscribe to the *climate change realism* metanarrative, in which they take the reality of climate change as a given, with no attempt at individual reflection on its ontology. Second, all the respondents subscribe to a *mediated concept* of climate change, in which they hardly have any personal views on the matter, largely regurgitating the conceptualisations of the media. Lastly, the concept of *climate change aversion* seemed to be a metanarrative to which all respondents bought into, with no questions asked. In their monolithic view, climate change is regarded as negative, without any distinction made between its causes and effects.

At a deeper level, it would appear that the Honours students from both Universities were exposed to only one source of information and one discourse and School Thought (The Anthropogenic). This seems to have affected their academic responsibility to think for themselves on all issues, because in their responses on perceptions of climate change, there was no evidence of critical thinking. It was again noticed there were no alternative criteria established for the evaluation of perceptions of climate change, neither was there any in- depth questioning of the scientific data that was presented. In their responses, the researcher could not find any allowance made for contrary views. Only a one-sided [biased, even bigoted] view was noticed in them. This made them appear to have been heavily indoctrinated in only one particular viewpoint. This then results in severely limited perceptions of the issue. It is blinkering them to other realities. For the sake of academic integrity, they need to be made to realise that climate change (CC) is a contentious issue with no clear-cut answers at present. Thus it would be wiser for them to take a multi-pronged approach in order to gain a deeper understanding of this divisive issue.

5.6 Recommendations for Further Research

Perceptions of climate change are among the key players currently and will be in the future and accordingly will need further study since it is at the centre of decision-making in the matter of this earth-threatening crisis. Both scholars and scientists who support either the Anthropogenic or the Sceptics Schools of Thought demonstrate some similarities and common ground since all are in agreement that climate change is occurring. However, the way it is happening is where different views and perceptions come into play, and they influence the determination of the policies that will need to be taken by both parties. South Africa and other developing countries are caught in the middle between a slowing down economic growth and are producing more greenhouse gasses in order to grow their economy. The perceptions among the key players (both present and prospective), such as the Honours students in Environmental Affairs, need to be understood in order to determine how they will perform professionally when in positions of power. Finally, the perceptions of climate change among Honours students in the field of Environmental Management needs further study, with a larger sample size based on international standards to check if it is going to influence policy makers on issues of climate change.

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APPENDICES

Appendix A: Questionnaire

These questionnaires have been taken from among the questionnaires used by Lorenzoni and Langford (2010) in a study of public perceptions on global environmental changes at East Anglia.

1. How much has climate change affected you?

.....

.....

2. What do you think about climate change?

.....

.....

3. Do you think climate change is a problem?

Yes ( ) No ( )

4. What do you know about the effects of climate change?

.....

.....

5. Do you think that policy makers understand the issue of climate change?

Yes ( ) No ( )

6. What is your role now and in the future regarding climate change?

Please tick (√) on the relevant response

1.	Not sure	
2	Planting trees	
3	Awareness	
4	Collect the plastics in the field	
5	Communicate the climate change to the society	

7. What do you think is the cause of climate change? Mark the relevant response.

a) Human activities	b) Ozone layer damage	c) Cans in the field	d) Natural system of the Earth

8 Does climate change affect you? Yes ( ) No ( )

If yes how? In what ways?

.....

.....

9) Where do you think climate change originates from? Tick (√) the relevant.

a) It is history	
b) Politics	
c) Dramatisation	
d) Natural formation	

10) Do you think South Africa has already felt the effects of climate change? Yes ( ) No ( )

If yes when? Tick (√) the corresponding answer.

a) Now
b) In one year to come
C) In 20 years to come
d) In 53 years to come
e) In 102 years a head
f) Do not know
h) Not at all

11) Do you think climate change is caused by cutting trees? Tick the relevant.

No	Probably not	Not sure	Almost definitely	Definitely	No answer

12) What do you think are the roots of climate change in Johannesburg?

Industry	
Poverty	
Traffic	
Power generation	
Burning fossil fuel	
Pollution	
Everything	
Waste	
Not Sure	
Other	

Appendix B Interview Schedule

Q1	May you tell me something about yourself (where you come from, academic level etc.)
Q2	Do you believe there is anything called climate change? Explain what do you know about it? How much have you heard about climate change before receiving this interview?
Q3	Where do you get your information about 'climate change'? Which source of information, about climate change, do you trust the most? Do you have enough information on climate change to form an opinion?
Q4	In the past three years what have you experienced, personally, which you attribute to climate change? In other words have you been affected by climate change personally? Do you think South Africa has, been affected yet?
Q5	What do you think, if any, are the negative effects of climate change for society and the environment?
Q6	Who do you think is most affected by these changes?
Q7	Should anyone do anything about "climate change" or its effects, where do you see the world in 50 years?
Q8	What do you think causes climate change?
Q9	Do you think there is anything, as human beings, we can do about it? What is your country doing about it? What do you think is your role in it?
Q10	Are you aware of any organization, international and locally, that are doing anything with regards to climate change? Which are they and what are they doing?

Appendix C

Permission letters

The Head

Department of Geography and Environmental Management

Florida Campus

University of South Africa

Att: To Prof Mearns

Re: Application for Research permission

Dear Sir/Madam

My name is Nzokizwa Benoit student number 33969574 and I am studying towards a Masters degree in Development studies with UNISA. My research focus is on perceptions of climate change among Honours students in Environmental Management.

I hereby seek permission to conduct research on the perceptions of climate change among Honours students in Geography and Environmental Management.

I will highly appreciate your permission to interact with the students in regard to the issues of perceptions of climate change.

The study has been reviewed by the higher degrees committee of the Department of Development Studies. In case of either confirmation or verification, please contact Professor Peter Stewart who is the Head of Development Studies, 012 429-6639 and Dr .Morgan Ndlovu who is my supervisor 012 429-2130.

Sincere,

Nzokizwa Benoit

Cell: 0742173707

Email: nzobnoit@webmail.co.za

The Head

Department of Geography and Environmental Management

Kingsway Campus

University of Johannesburg

Att: To Prof Ahmed

Re: Application for Research permission

Dear Sir/Madam

My name is Nzokizwa Benoit student number 33969574 and I am studying towards a Masters degree in Development studies with UNISA. My research focus is on perceptions of climate change among Honours students in Environmental Management.

I hereby to come to your high authority to seek permission to contact a research on perceptions of climate change among Honours students in Geography and Environmental Management.

I will appreciate to be assisted by your high authority by granting me a permission to interact with the students in regard to the issues of perceptions of climate change.

The study has been reviewed by the higher degrees committee in Development studies in case of confirmation please contact Professor Peter Stewart who is the head of development studies, 012 429-6639and Dr.Morgan Ndlovu, who is my supervisor on 012 429-2130.

Sincere,

Nzokizwa Benoit

Cell: 0742173707

Email: nzobnoit@webmail.co.za

Appendix D

Informed consent

I, Nzokizwa Benoit, the undersigned, I am a Masters student in the department of Development studies at the University of South Africa. In fulfillment of the requirements for the Masters, I have to undertake a research project. In which here I invite you to take part. Before you decide whether or not to take part, it is important that you understand what the research is and what you will be asked to do. Please do not hesitate to ask any questions about anything that might not be clear to you. Make sure you are happy before you decide what to do. Thank you for your consideration to this invitation.

This study has been reviewed by the Research Ethics Committee of the Department of development studies at University of South Africa. Without the approval of this committee the study will not be conducted. If you have any questions please feel free to contact the chairperson of the research and ethics committee of department of development studies at University of South Africa.

Contact number: Prof Peter Stewart.012 429-6639 who is the Head of Department of Development studies, as well as And Dr. Morgan Ndlovu who is my supervisor.

Participant's signature: .....

Researcher signature: .....